100 YEARS AFTER THE GOLDEN SPIKE

May 10, 1969

RAILWAY AGE

THE TRANSPORTATION WEEKLY

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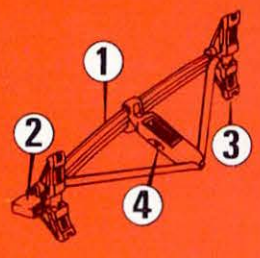
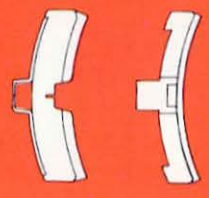
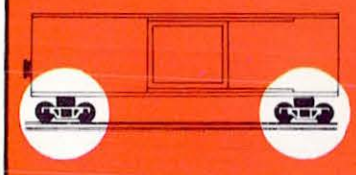
Buffalo Unit Brake Beams are quality built throughout. 4 different metals are used because they are the best answer to 4 different wear problems. The standard braking system utilizing Buffalo Unit Brake Beams gives you low first cost and proven low maintenance.



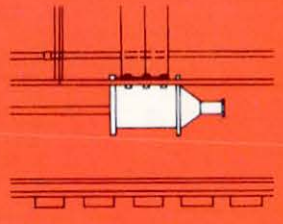
Beam is a one-piece forged steel truss(1). Heat treated wear plates(2). Malleable brake head and strut(3). Hardened steel bushings(4).



Buffalo Brake Beams are designed for all AAR brake shoes. You choose the material and thickness best suited to your needs.



You have the advantage of hand brakes on BOTH trucks and the safety of braking all 8 wheels.



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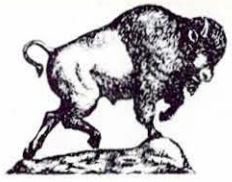

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Railroad Milestones

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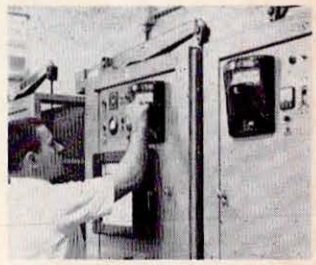
One of the great new advances in railroading has been in completely new concepts of high-speed transportation. An example is the Turbo-Train now undergoing tests and, hopefully, soon to be in daily service. The design of this train is based upon the technology of flight; it is powered by aircraft-type jet engines, its interior and exterior resemble jet aircraft. It has attained speeds of over 170 mph, but initially its operational top speed will be about 120 mph. It rides on Edgewater wheels.

We are pleased that Edgewater wheels have been chosen for this train, as well as for other recent high-speed railroad and urban transit projects.

America's railroads and their suppliers can well be proud of other technological advances—special-purpose cars, high-cube cars, more powerful locomotives. And Edgewater is making every effort to provide wheels that match the progress being made in railroading.



FOR MILESTONES AHEAD:
Using the most modern equipment and techniques, Edgewater metallurgical laboratories study the strength, ductility and other physical properties of steel under stress. Independent research laboratory facilities are employed to test wheels under simulated operating conditions. The objective: to prepare Edgewater Wrought Steel Wheels for milestones ahead.

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HUNT-SPILLER WAS 59 YEARS OLD IN 1869

...when the transcontinental rail link was completed

Over the trails that General John C. Fremont had marked out, the Union Pacific and the Central Pacific raced to see who could build the most track in the big push to complete the last link. One day in May, 1869, the two roads met at Promontory, Utah, at the northern end of Great Salt Lake. Hunt-Spiller was already 59 years old.

It was during this era that Hunt-Spiller expanded the use of their famous Gun Iron to the manufacture of certain wearparts for steam locomotives. As the railroads grew, so did the use of Hunt-Spiller Gun Iron parts—to service on practically all railroads in the United States, Canada, Mexico and throughout the world.

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May 10, 1969 • Vol. 166, No. 17

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100 YEARS AFTER THE GOLDEN SPIKE

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. . . AND COMING NEXT WEEK

Tomorrow's Railroads: Operations and quality. The May 19 issue of Railway Age will contain the fifth section of a 12-part Golden Spike Centennial Year series exploring what can and must be done—now—to create the 21st Century railroad . . . the 21st Century transportation system. Next week's article will place special emphasis upon the role of the customer—his increasing demand for quality service at a price—and how railroads can best meet that demand.

Railway Age, established in 1856, is indexed by the Business Periodicals Index, the Engineering Index Service and the Public Affairs Information Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.
Published weekly (except for four issues combining two-in-one) by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010.
Railroad employees' subscription rate, U.S. possessions, Canada and Mexico, $6 one year, $9 two years, all others $15 for one year, payable in advance and postage paid. To railroad employees elsewhere in the western hemisphere, $10 a year. Single copies 60¢ except special issues.
Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 961, Bristol, Conn. 06010.
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Circulation Dept.: John Rogers Director of Circulation, 30 Church St., New York, N.Y. 10007. POSTMASTER—SEND FORM 3579 TO P.O. Box 961, BRISTOL, CONN. 06010.
Printed at the Hughes Printing Co., 34 North Crystal St., East Stroudsburg, Pa. 18301. Second-class postage paid at Bristol, Conn., and at additional mailing offices.

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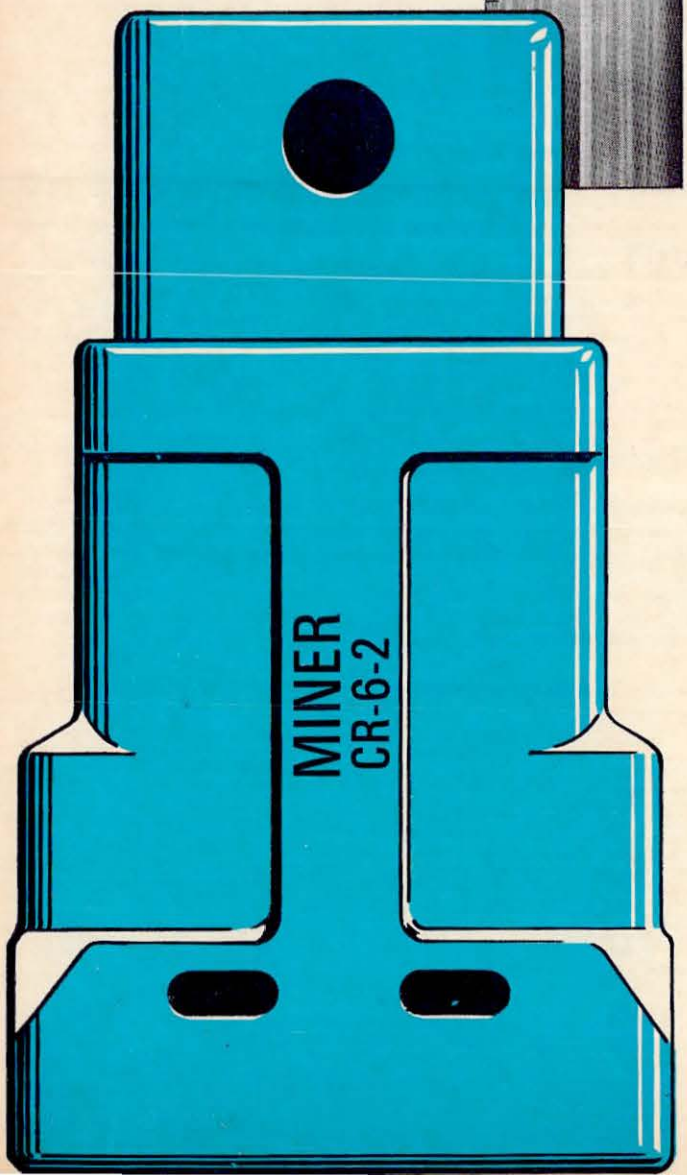

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SHORT AND SIGNIFICANT

Canadian "gold spike" on May 28

Alberta Premier Harry Strom will drive the final spike on the new 235-mile, $96-million Alberta Resources Railway at Grande Prairie, Alta., on May 28. This new railroad, built and operated for the province by the Canadian National, extends northward from CN mainline through an undeveloped region just east of the Rockies. Coal destined for Japan and moving in unit trains is expected to constitute the first freight; prospective traffic includes pulpwood and grain.

Progress: Sometimes it comes slowly

Burlington is looking for ways to preserve and improve branchline service in granger country—but a little help and understanding would be appreciated. Traffic Vice President Fred E. Deines told a Nebraska Transportation Institute audience that "the luxury of moving small amounts of traffic over hundreds of miles of branch lines" may give way to the trucking of grain from local elevators to elevators located along main lines. But, he said, freight service for many small communities could be greatly improved if Burlington can expand its use of mobile offices for local agents. Unfortunately, not everybody is getting the message. There was the case of the chamber of commerce in a small Iowa town which opposed a switch to mobile-office service: "While the railroad delayed inaugurating the new service , the high costs—which the mobile office would have reduced—kept going higher. In a short time, this 59-mile branch line had accumulated such extensive losses that the railroad was forced to abandon it and end all rail service to the area. The conomies realized from mobile-office operation probably would have kept that line in operation."

Derailments prompt track inspection order

The Illinois Commerce Commission is ordering railroads operating in the state to undertake new inspections covering about 26,000 miles of track—13,000 miles of mainline, and 13,000 miles of other track which are to get a "summary" inspection. Railroads have until May 15 to arrange for inspections with Commission officials. A series of derailments, in Illinois and elsewhere, is cited as the reason for the order. The new chairman of the Commission has been quoted to the effect that "the situation cried for action and I have jumped into it."

Commission says it won't block Northwest offer

The Interstate Commerce Commission indicated last week that, so far as it is concerned, Northwest Industries can go ahead and make a tender offer for B. F. Goodrich Co. Responding to a Goodrich petition for ICC approval of securities to be issued by Northwest, the Commission ruled there was no proof that the issuance "would adversely affect the common carrier subsidiaries of Northwest Industries or their ability to maintain transportation service." ICC did say, however, that Goodrich can be a party in proceedings to be re-opened for a look at Northwest's books.

Holiday plans intermodal industrial park

Holiday Inns of America, Inc., will build an industrial complex at Olive Branch, Miss. that will feature Frisco Railway service, a jet-capacity airport and paved access to interstate highways. The 3,000-acre Holiday Industrial Park will be 15 minutes away from Memphis International Airport and only four miles from Frisco's Tennessee Yards in Shelby County.

TOFC group organized in New York

Railroads serving the New York metropolitan area and offering TOFC services have organized the New York Piggyback Association. The purpose of the organization, according to spokesmen, is to promote interest in and provide information about the broad areas of TOFC services that are available in the New York area.

MONDAY MORNING REPORT

A CENTENNIAL REALIZATION

Since the start of this centennial year, the Association of American Railroads has turned out projects with almost unprecedented rapidity. In addition to plans for the Golden Spike observance, there have been crucial legislative proposals, and above all, projects covering rail operations for the supreme goal of an efficiently-used car fleet. The announcements have come with the speed of an old champion with a new realization of his strength. For that reason, they have come with boldness.

ROOM FOR EVERYONE

From almost all directions, word has come that the world of transport is big enough for everybody, that the treasures can be shared by all, but that everyone has to become worthy of the prize. Thus, AAR is issuing guidelines for a conditioning that will move the rail industry solidly into the picture of coordinated transport, which has become a conversation piece as common among Transportation Department spokesman as rail transport was among federal speakers in 1869.

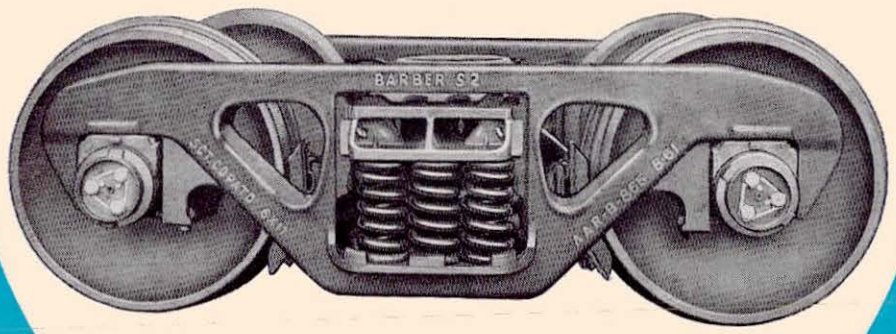
DATA SHARING WILL HELP

Among the projects is AAR participation in cross-carrier information sharing. Rails will contribute 20% of the annual costs for a non-profit transportation data coordinating committee based in Washingon, D.C. Other shares will include: trucks, 10%; air, water and freight forwarders, 20%; and shippers-users, 50%. From standardization of commodity codes, tariff reconstruction, and speedy data processing will come coordination for the golden objective of performance that fully meets the nation's transportation needs.

NONE WILL BE PEASANTS

Rails finally have learned a lesson from the fate of the horse-drawn competitors they pushed off the road so easily. The lesson is that strength is needed not only for competition, but for the cooperation that in the long run may prove the better preservative. This week's clang of the mallet on the golden spike will be one of the first sounds of the intermodal era. The 1869 spike driving marked the start of the era when trains would be king, because the spike was a coffin nail for the pony express, the stagecoach and the covered wagon. The 1969 ceremony at Promontory marks the start of an era when nobody may be king—but nobody will be a peasant, either.

Why the name "Barber" on a freight car truck makes it a better buy!



IT'S THE "TOTAL DESIGN" CONCEPT

A Barber Stabilized Truck is a Total Design Concept, plus the product. The result—Low Cost —Greater Protection—Longer Life—Lower Maintenance.

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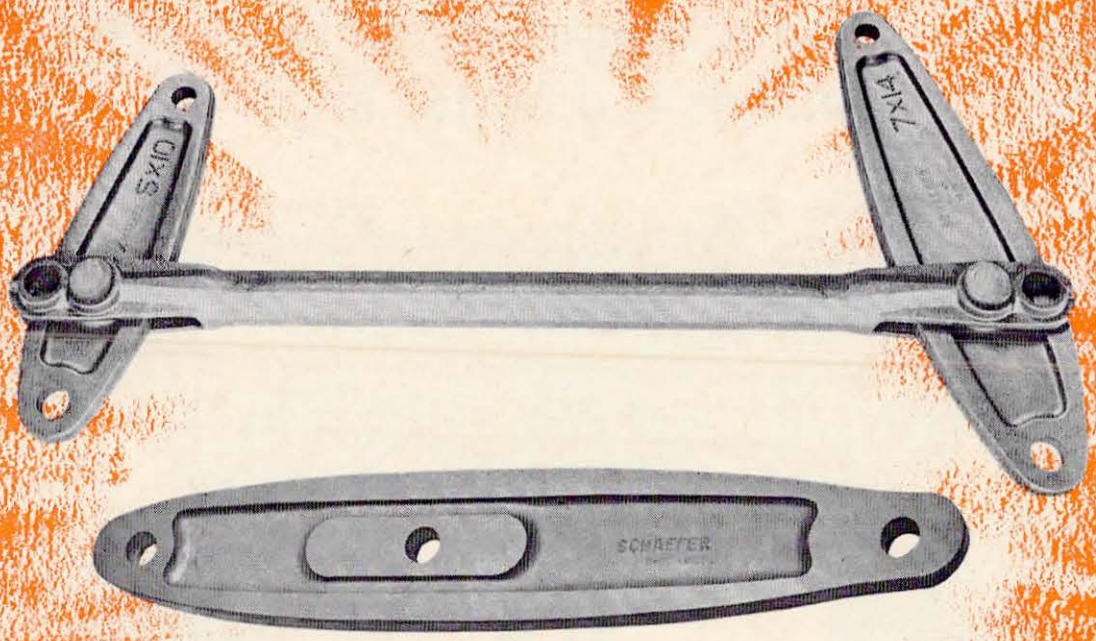

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WEEK AT A GLANCE

L&N-Monon:Southern enters the picture with a proposal

For a long time, merger-watchers have been wondering about the effects of southwestern and southeastern roads' proposing entries into Chicago—and about Southern's reactions. Until recently, Southern remained aloof—while Missouri Pacific and Louisville & Nashville headed for Chicago via Chicago & Eastern Illinois, and while L&N also proposed picking up Monon. Now, Southern is moving. It's supporting a Milwaukee Road request for trackage rights over Monon into Louisville, Ky., in the event L&N-Monon merger is approved. Going a step further, Southern says that if L&N cancels the deal as a result of imposition of the Milwaukee conditions—or for any reason—Southern will be willing to make an offer for Monon which would be "of equal or better value to Monon stockholders than the exchange offer of L&N." Southern President W. Graham Claytor, Jr., confirmed that his road in the past had decided it was not interested in Monon. Changing times and conditions, he indicated, brought about a reassessment of position.

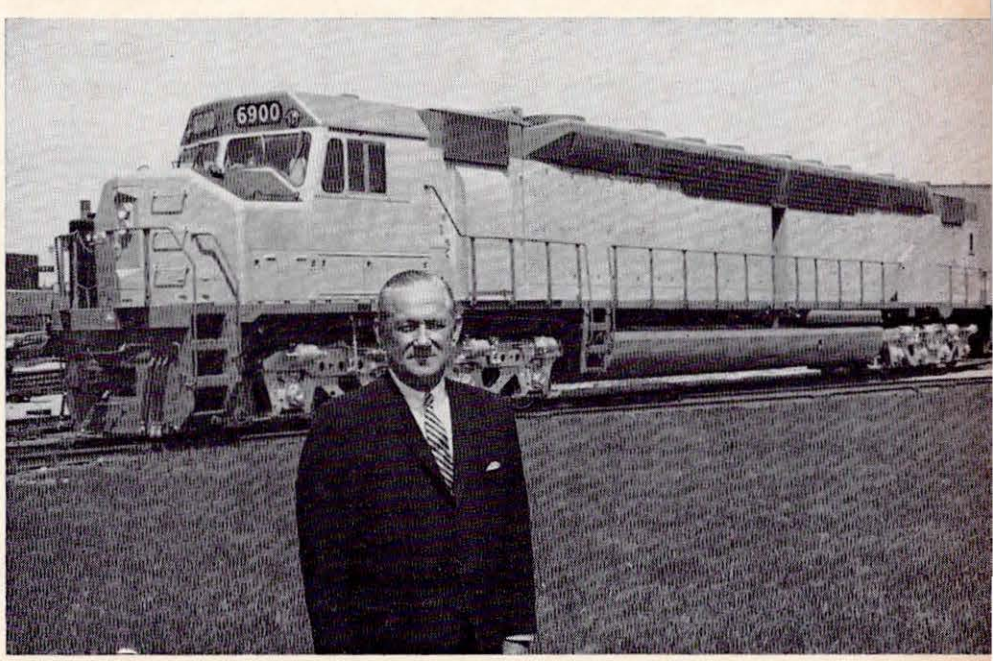
Chicago: One station closing leads to another

With Chicago's ancient Grand Central Station set for closing, it might have been expected that others of the city's many terminals would soon follow. And they will.

Next in line will probably be LaSalle Street Station, now occupied only by Rock Island, since Penn Central merger and transfer of former New York Central operations to Chicago Union Station. Dearborn Street Station, third of the city's south-of-the-Loop depots, may pose more difficult problems in abandonment—but talkes are going on and Dearborn, too, may eventually feel the wrecker's ball. Union, Illinois Central and North Western Stations will survive (RA, May 5, p. 7).

From EMD to UP: 6,600 horses of "Centennial" power

B. B. Brownell, vice president of General Motors and general manager of Electro-Motive Division, stands before the first of 47 new 6,600-hp diesel locomotives to be delivered to the Union Pacific. One of the most powerful diesel electrics ever produced, the 98-foot, 536,000-lb locomotive is rated at 1,100 hp above the most powerful units now in service. The UP order for 47 engines represents a sizeable increase in the original order placed with EMD in 1968. UP had only 25 of the double-engined locomotives on order at that time. Referred to as the "Centennial Diesel", it will take part in the Golden Spike Centennial celebration at Promontory, Utah, on May 10. The new diesels represent part of a $120-million equipment program that UP has scheduled for 1969. UP President Edd H. Bailey calls the program one of the largest in the road's history.



GUS WELTY

LINES ON LABOR

AT GOLDEN SPIKE TIME, there's a real temptation to wax romantic—to dwell at length upon stories of iron men and wooden cars, of brave surveyors and Indian fighters, of bold engineers and brawny track foremen. Those were the days, indeed they were. They were days when a different breed of railroad man roamed over the land.

THESE WERE HIGH-SPIRITED MEN. The only problem was that in many cases their high spirits resulted mostly from their getting high on spirits. Result: Railroad men of those good old days were more apt to be found leaning on a pillar of the community than being one.

A RE-READING OF HISTORY seems to reinforce the view of the old-time railroader as something of a tippler. It was no accident, for example, that the Brotherhood of Locomotive Engineers adopted as its motto "Sobriety, Truth, Justice and Morality," or, probably, that the BLE's founding fathers listed the fine qualities in that order. It was also with forethought that the BLE, soon after its founding in 1863, adopted a constitutional provision under which a member could be expelled if he were found guilty of conducting himself "in a manner unbecoming a man." As Reed C. Richardson notes in his excellent history of the union, that phrase covered a multitude of sins—including improper language, dishonesty in not paying debts, violation of obligations, drunkenness, insolence to superior officers, fraud, deserting families, moral offenses, and what was described as general misconduct.

THE ENGINEERS' 1864 constitution was just a bit more specific. "Occasional intoxication," it said, "shall subject a brother to the censure of the division, and habitual intoxication shall be considered sufficient cause for the expulsion of any member." Constitutions written later, in 1868 and 1870, added provisions barring members from double-heading as engineers and saloon-keepers.

IT'S UNFAIR, of course, to single out the locomotive engineer as the most enthusiastic drinker of his era. He had plenty of company, on and off the railroad. But it is definitely to the credit of the BLE that it mounted a determined attack on the problem. One might think that a young and struggling union would wink at such things until it developed a bit more strength—but not the BLE. Paving the way for union organization on the railroads may have been the BLE's biggest accomplishment. Sobering-up the engine crew was perhaps no lesser a feat.

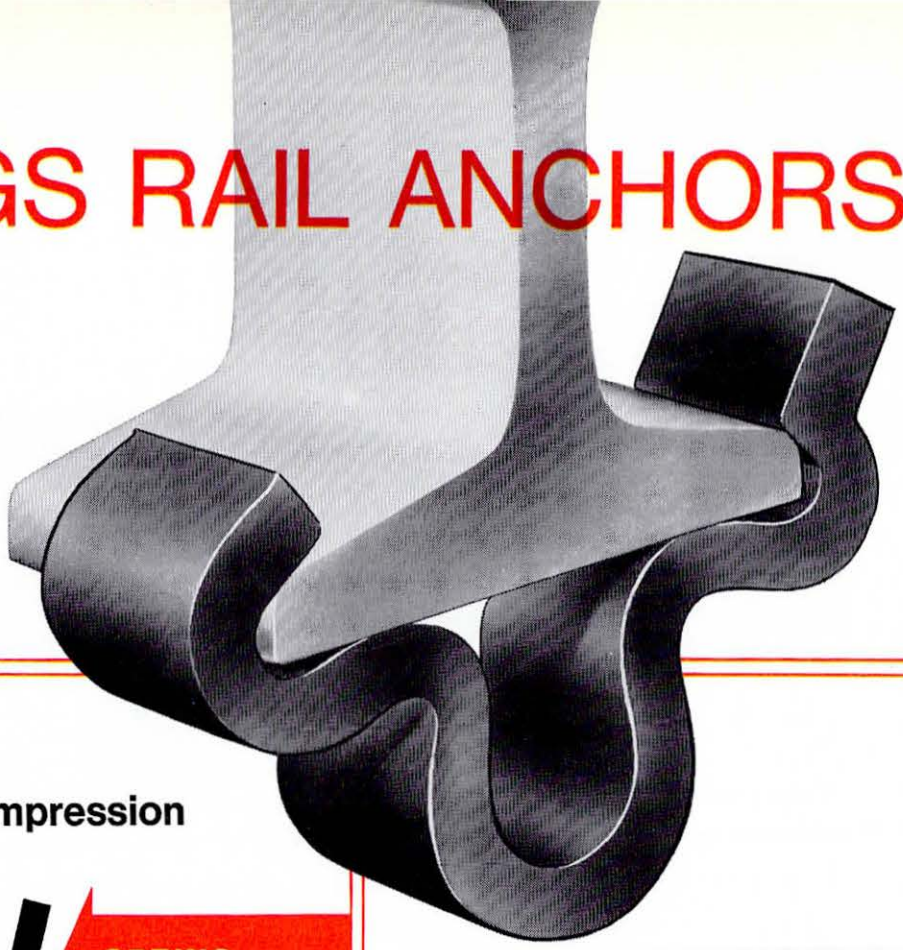
Legislature gets transit-aid bill in Illinois

Illinois may turn to a motor-fuel tax as a means of aiding financially-troubled public transportation systems. A bill now before the state legislature would permit imposition of a tax, not to exceed two cents a gallon, for transit assistance in certain counties. As matters stand, three counties would qualify—Cook (Chicago), Madison and St. Clair. George L. DeMent, chairman of the Chicago Transit Board, said the bill could "provide the means for solving Chicago Transit Authority's financial problems. We have gone as far as we can go with fare increases. We know that we cannot raise fares again and put an additional burden on our riders. We are in dire need of a subsidy, and this bill will provide the much-needed funds." CTA has boosted fares twice in the past two years, up to a basic fare of 40 cents. Patronage has dropped by about 18% as a result. And even with the fare increases, the Authority is still estimating that its 1969 deficit will total $11.7 million. Financial problems have also brought cuts in the '69 capital budget—which now stands at $15.1 million. A budget totaling $31.2 million was originally proposed. With finances in a bind, CTA says, it has no money for such things as replacement of 40 and 50-year-old rapid-transit cars, replacement of 20-year-old buses, construction of park-and-ride facilities or remodeling of transit stations. If the tax bill passes, Cook county alone could provide revenues of about $15 million for each one cent levied.

Volpe pledges ARR development

As Secretary of Transportation, John A. Volpe is also boss of the Alaska Railroad. Last week he assured the North Commission that he won't take the job lightly. "The potential of the line for development is recognized by this Department and we intend to make full use of that potential," said Volpe. He pointed out that 75% of Alaska's gross state product is produced within the railbelt and is directly dependent on it. Two-thirds of the population is also centered within this belt, noted Volpe. The economic importance of the carrier is indicated by the fact that it carried 1,481,467 tons of freight in fiscal '68, said Volpe.

This is how WOODINGS RAIL ANCHORS get their great holding power...



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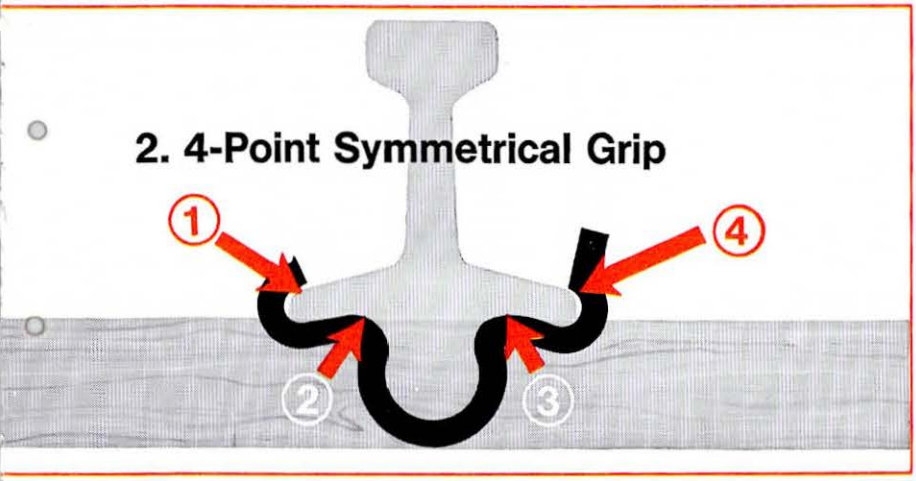

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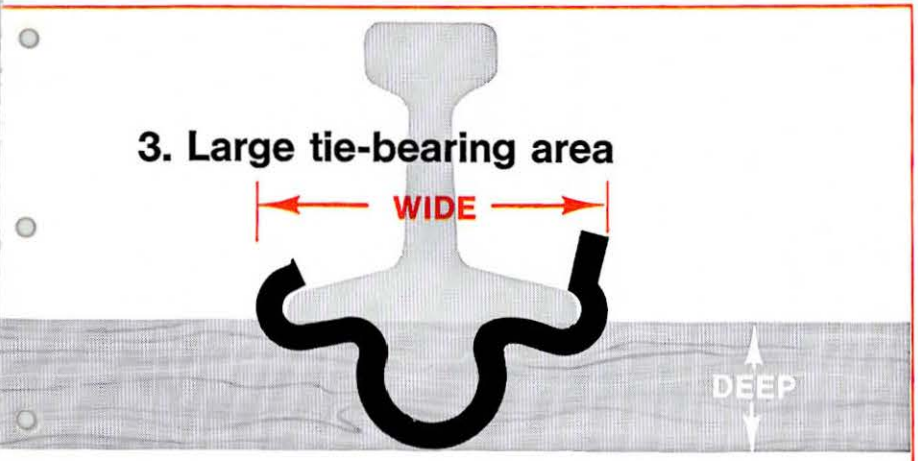

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OTHER ADVANTAGES

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SPECIFY

Woodings Advanced Type Rail Anchors for holding power and economy.

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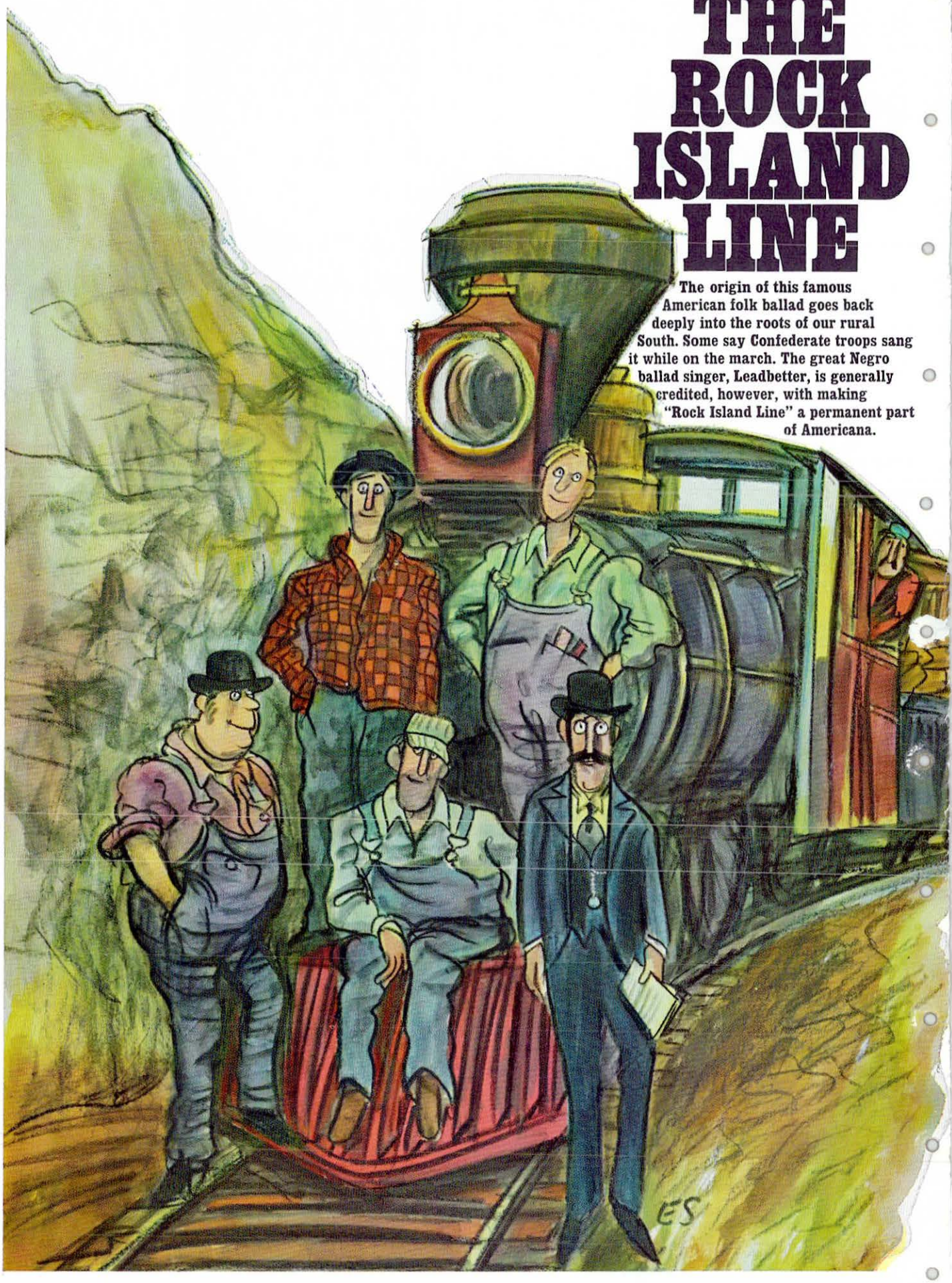
THE ROCK ISLAND LINE

The origin of this famous American folk ballad goes back deeply into the roots of our rural South. Some say Confederate troops sang it while on the march. The great Negro ballad singer, Leadbetter, is generally credited, however, with making "Rock Island Line" a permanent part of Americana.



There's room for me
There's room for you
Plenty of room for the Rock Island crew
Rock Island Line is a mighty good road
Rock Island Line is the road to ride
Rock Island Line is a mighty good road
If you wanna ride it
Gotta stride it like you're flyin'

Get your ticket at the station
On the Rock Island Line

Engine in front
Caboose in the back
Goes so fast most leaves the track
Well now the Rock Island Line
It is a mighty good road
Rock Island Line
It is the road to ride
Rock Island Line
It is a mighty good road
And if you wanna ride it
Gotta stride it like you're flyin'
Get your ticket at the station
On the Rock Island Line

This train goes flyin' on by now
This train
This train goes flyin' on by now
This train
This train goes flyin' on by now
Whistle and smoke
Gonna fill the sky now
This train goes flyin' on by now
This train

Waa Waa Waa Waa Waa . . .
Now the Rock Island Line
It is a mighty good road
Rock Island Line
It is the road to ride
Rock Island Line
It is a mighty good road
And if you wanna ride it
Gotta stride it like you're flyin'
Get your ticket at the station
On the Rock Island Line

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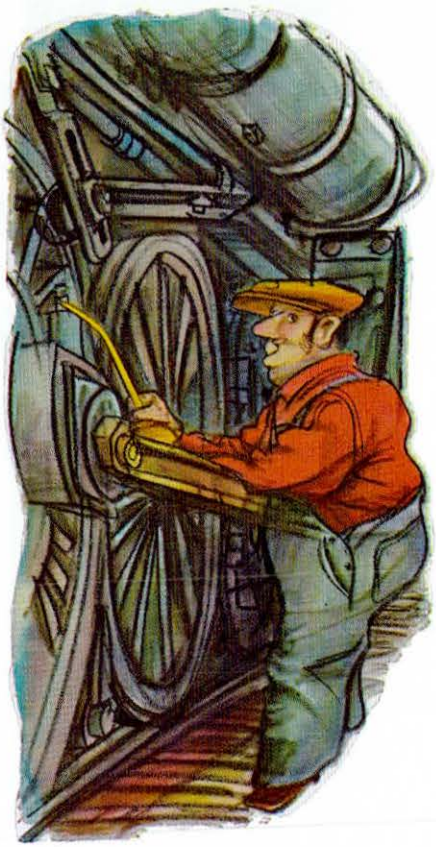
On the Rock Island Line



Railroading has seen many changes for the better since "Rock Island Line" first whistled its way into the American heart. New Departure-Hyatt is proud to have played its part in this saga from steam and smoke and hotboxes to the sleek Diesels and dependable NDH Taper Freight Bearings of today.

The romance of our railroad past will always be remembered in songs like this. It's the breakdowns and downtime we're happy to forget. And we'll forget them even more in the future—thanks to important advances in bearing design and manufacture that NDH engineers are working on right now!

If you'd like a full-color reprint of this advertisement, we'll be happy to send it to you, upon request. It will carry no commercial message, so you can frame it for your office.

GM
MARK OF EXCELLENCE

NEW DEPARTURE-HYATT BEARINGS
Division of General Motors Corporation; Sandusky, Ohio 44871

©New Departure-Hyatt Bearings Division, General Motors Corporation 1968.
Rock Island Line—Copyright, 1961, Bigareff Music, Inc., New York, New York.

In the year 2069 the Union Pacific could be "toasting" a 3/4 inch cushion of air!

UNION PACIFIC RAILROAD

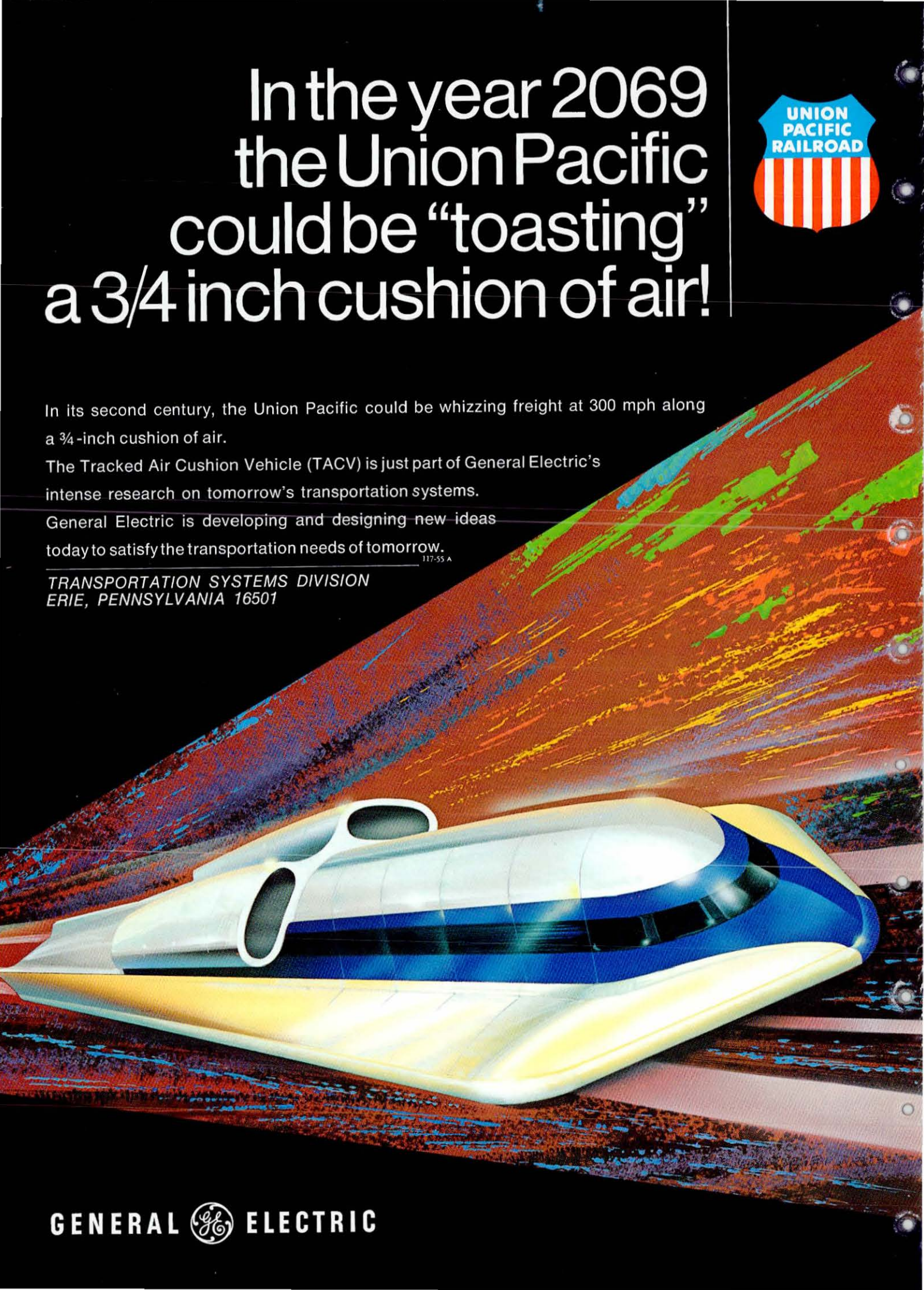
In its second century, the Union Pacific could be whizzing freight at 300 mph along a ¾-inch cushion of air.

The Tracked Air Cushion Vehicle (TACV) is just part of General Electric's intense research on tomorrow's transportation systems.

General Electric is developing and designing new ideas today to satisfy the transportation needs of tomorrow.

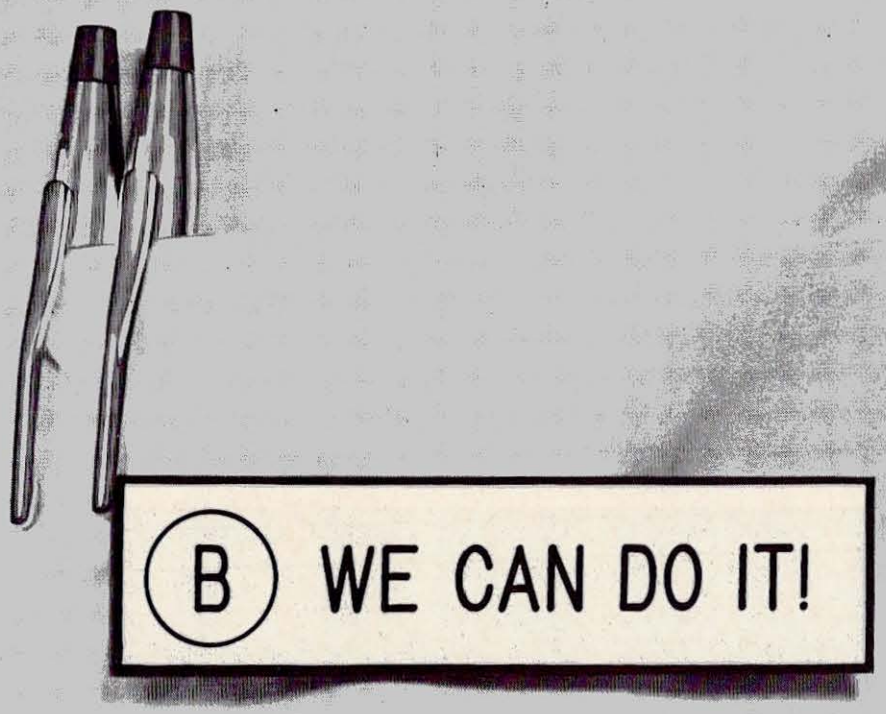
117-55 A

TRANSPORTATION SYSTEMS DIVISION
ERIE, PENNSYLVANIA 16501



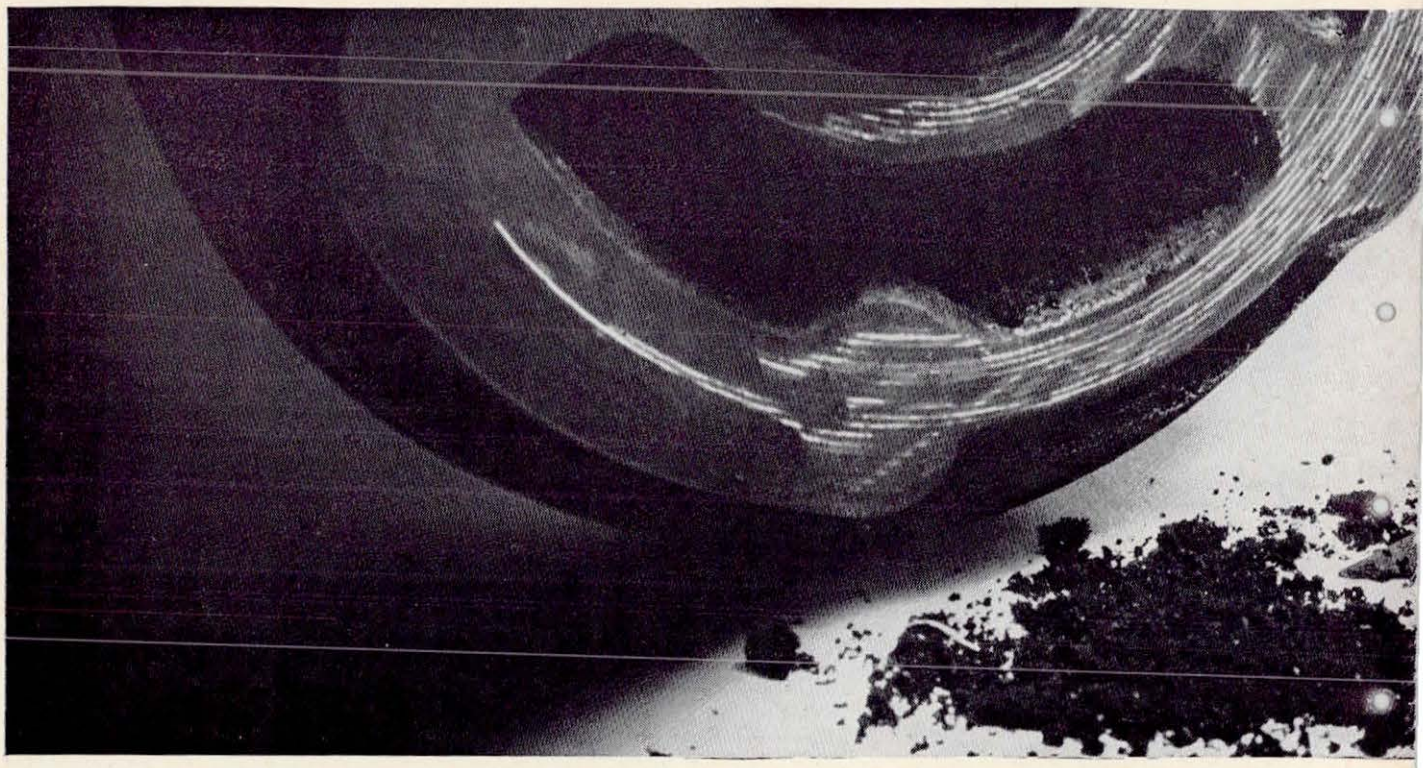
GENERAL ELECTRIC

MEMBER RPI RAILWAY PROGRESS INSTITUTE



Circle 9 on coupon page 109

Shell announces railroad air compressor oils that control discharge valve deposits.



Breakthrough: New Shell railroad air compressor oils minimize discharge valve deposits—in some cases, eliminate them.

These new oils work to keep the discharge valve dry. This minimizes wet oil and deposits passing into the braking system—all while providing high-temperature oxidation protection, excellent lubrication and low oil consumption.

Advantages: significantly lower maintenance costs, safer operation, increased equipment utilization.

Cause and cure.

Discharge valve deposits are mostly oxidized oil. This is the main reason why conventional air compressor oils are blended for oxidation stability.

Then how come, Shell scientists asked, heavy deposits are often found in compressors using highly stable oils?

Answer: Oxidation stability, while needed to minimize lacquer and varnish formation, is not the only factor involved in discharge valve deposits. These deposits, Shell found, are related more to the time the oil is in the hot zone of the compressor.

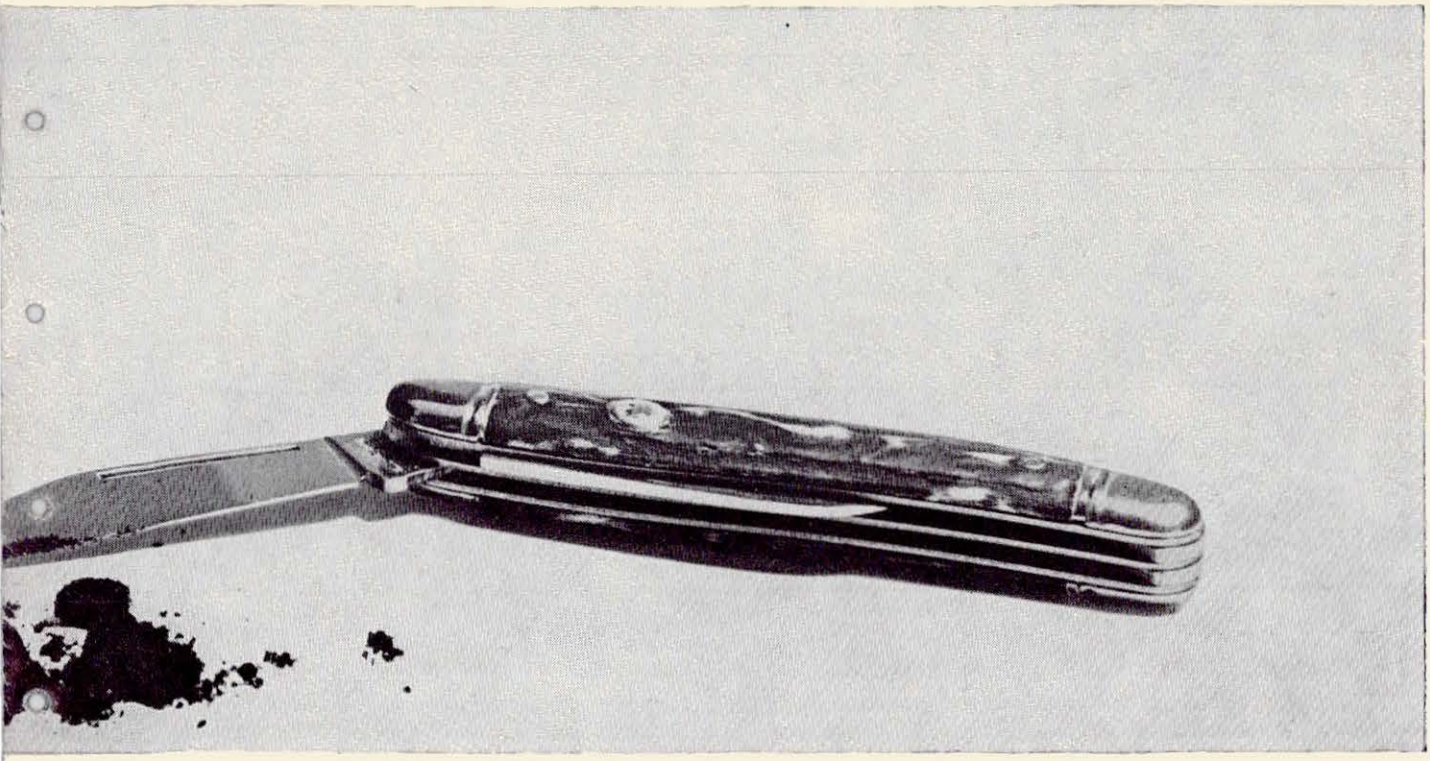
The troublemaker.

Further research showed that volatility of the oil was the dominant factor. "Heavy end" oil fractions of low volatility were pinpointed as the primary source of discharge valve deposits.

Result: Each grade of Shell Railroad Air Compressor Oil is blended in a narrow volatility range. Each grade meets the volatility needs of the particular viscosity required.

Three viscosities available.

Shell Railroad Air Compressor Oil 27, SAE 10W grade, is designed for



all deep-sump Gardner-Denver air compressors. We recommend it where an SAE 10 oil is specified by the locomotive builder.

Shell Railroad Air Compressor Oil 33, SAE 20 grade, is designed for Westinghouse water-cooled air compressors. We recommend it where an SAE 20 oil with 0° F pour point is specified by the locomotive builder.

Shell Railroad Air Compressor Oil 41 is an SAE 30 oil, 0° F pour point, for use in all makes of air-cooled compressors and small-sump, water-cooled conversion compressors. We recommend it where locomotive builders do not specify other grades, in the interest of simplified inventory.

Call one of these offices.

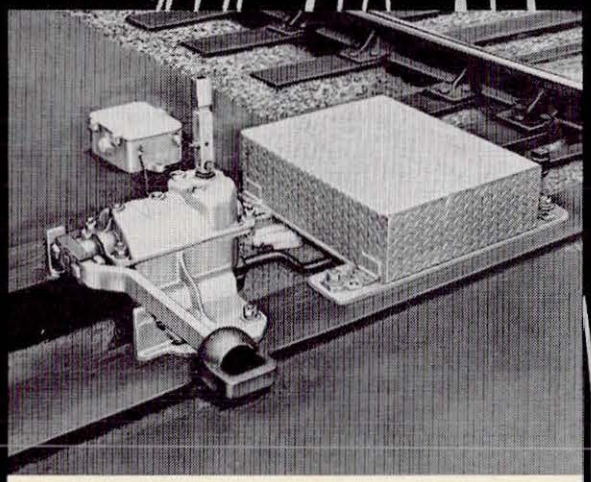
For details, call the nearest Shell Railroad Representative: Baltimore (301) 821-5905; Chicago (312) 341-3275; San Francisco (415) 392-5400. Or write: Shell Oil Company, Department RO/U, P. O. Box 1890, Trenton, New Jersey 08607.

SHELL

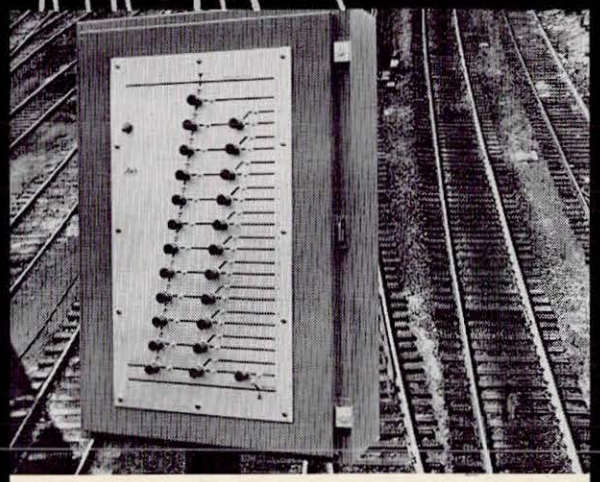
MEMBER RPI RAILWAY PROGRESS INSTITUTE

Circle 10 on coupon page 109

RACOR PUSHBUTTON HELPS SPEED CARS AND KANSAS CITY SOUTHERN



Heart of the pushbutton flat yard is the Racor switch stand and electrically-powered, hydraulically-operated switch machine. It completes a throw in 1 second. In trailing movements, the switch can be run through repeatedly—the wheel flanges open the points, and the throw is completed by the stand. Unnecessary stopping and throwing by hand is eliminated.



At the New Orleans flat yard of the Kansas City Southern, buttons on 5 strategically located weatherproof panels provide remote control and position indication for 37 Racor switch machines. In the Beaumont yard one panel controls 6 switches. The Baton Rouge installation, when completed, will utilize 46 Racor switch machines divided between two control panels.

SWITCHING REDUCE COSTS FOR

The Kansas City Southern, with less time and effort, is moving cars through flat yards equipped with Racor pushbutton switching. No hopping on and off locomotives...no walking down the ladder...no hand throwing of switches. A switchman simply pushes buttons to align the switches!

The first yard, installed at New Orleans in 1965-66, has 37 Racor switch machines with 5 outdoor weatherproof panels located throughout the yard: 33 switches on 4 panels installed in 1965; 4 on one panel installed in 1966.

In 1966, the Beaumont yard installed 6 Racor pushbutton switches and one outdoor panel.

In 1968, the Baton Rouge yard—now under construction—will have 46 Racor pushbutton switches operated from 2 panels: 22 switches on one panel and 24 on the other.

Racor pushbutton switching with trackside control saves time in walking to and from switches...promotes safety...permits easy hand throws in case of power failure. The stand can be intentionally trailed.

Fingertip control of flat yards with Racor switching equipment can show almost immediate return on investment. New units can be added to keep pace with traffic growth and yard expansion.

The versatility and flexibility of this equipment has been demonstrated in yard after yard from coast to coast.

Talk to your Abex representative if you'd like to see Racor pushbutton switching in action.

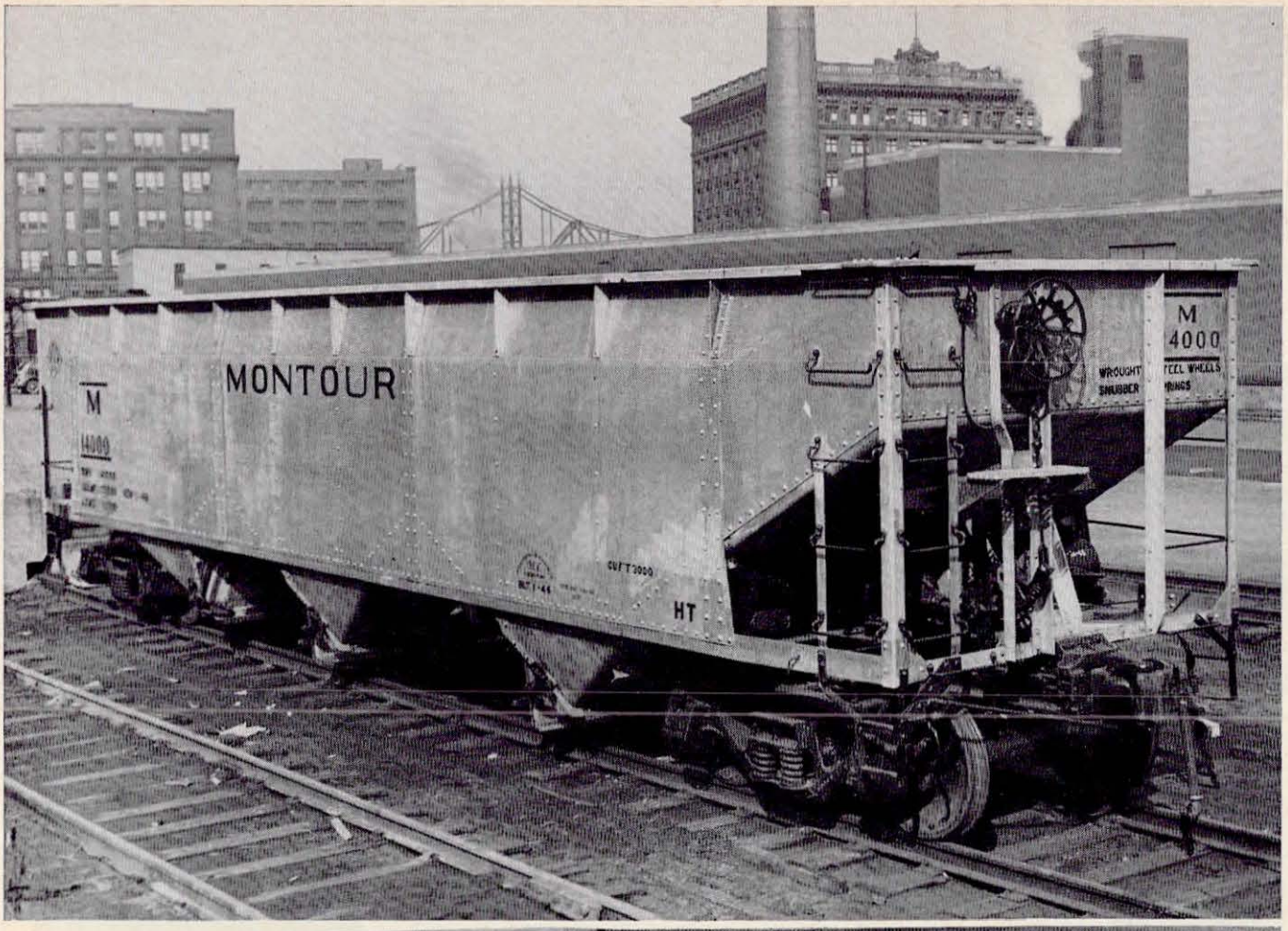
MEMBER RPI RAILWAY PROGRESS INSTITUTE

Abex CORPORATION

Railroad Products Group

VALLEY ROAD, MAHWAH, N. J. 07430

Circle 11 on coupon page 109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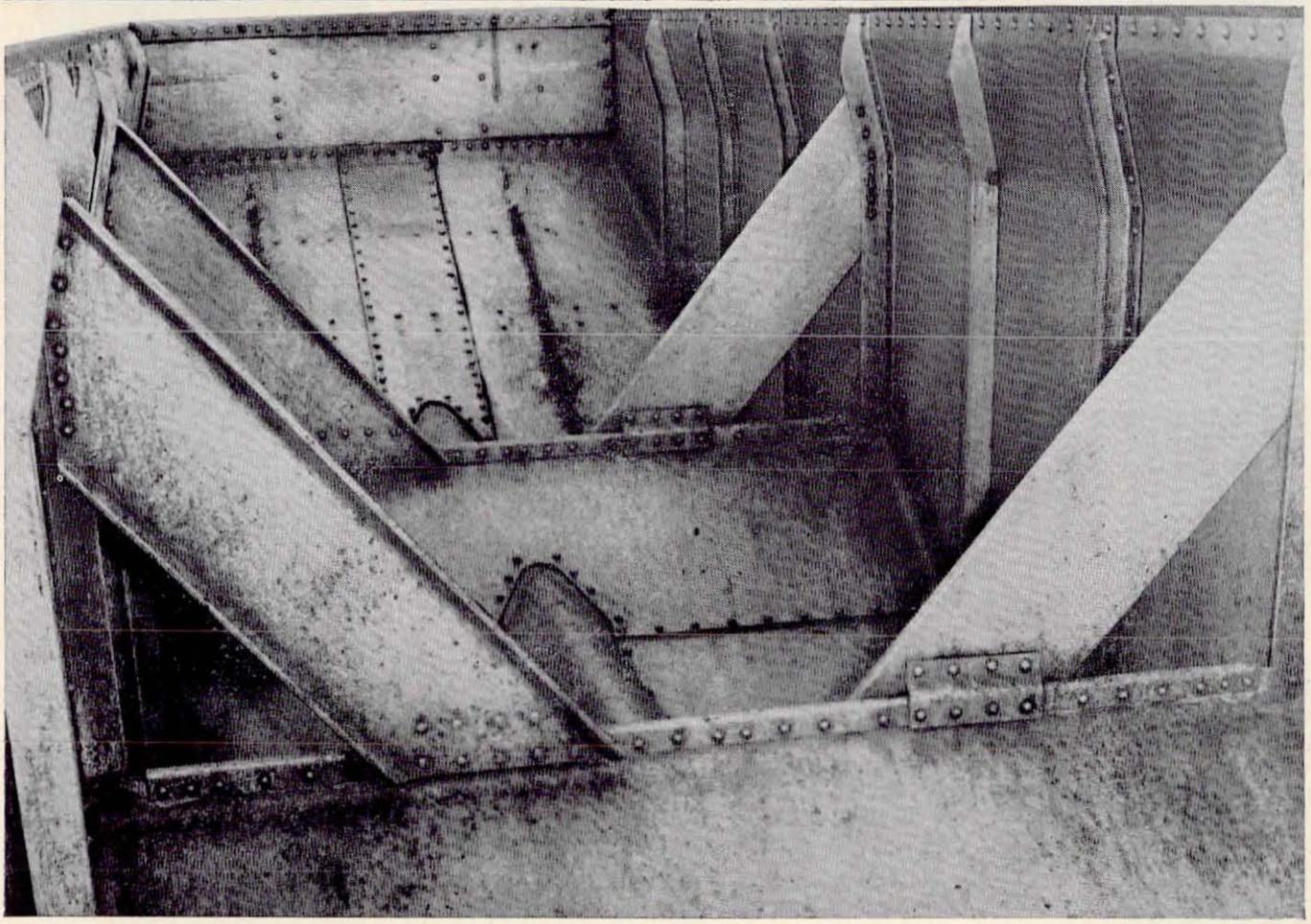


1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969...

For the past 23 years, this aluminum coal car has been rotary-dumped on the average of twice every three days. It still has a lot of life left. It's Alcoa® Aluminum. (The Montour 14000 was built in 1946 by American Car & Foundry.)

Tests over a 30-year period on aluminum and steel hoppers in a corrosive environment have shown that aluminum retains nearly four times the tensile strength of steel. In fact, other materials failed after 17 years, while the aluminum hoppers still had years of service left after 30.

Long life, extra payload—up to 8 tons in a 100-ton car—and low maintenance are some of the features that aluminum offers the transportation industry. The men who know aluminum best are at Alcoa. To find out more about the advantages of aluminum, send this coupon.

Aluminum Company of America
1750-S Alcoa Building
Pittsburgh, Pa. 15219

GOLDEN SPIKE CENTENNIAL

Gentlemen: Please send me information on ☐ corrosion studies; ☐ economies of aluminum-bodied coal cars.

Name _____

Company _____

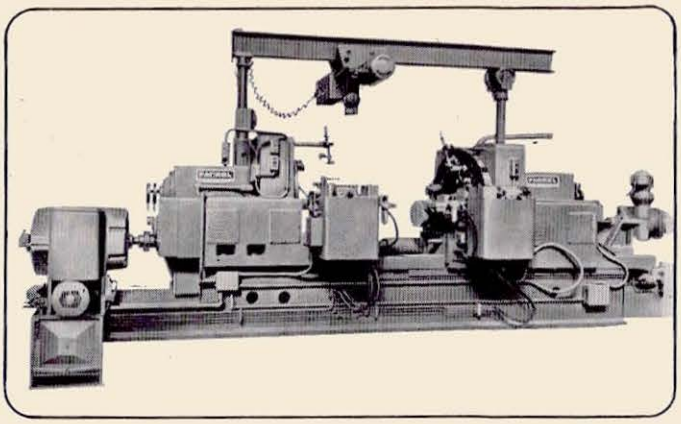
Address _____

City _____ State _____ Zip _____

Change for the better with Alcoa Aluminum

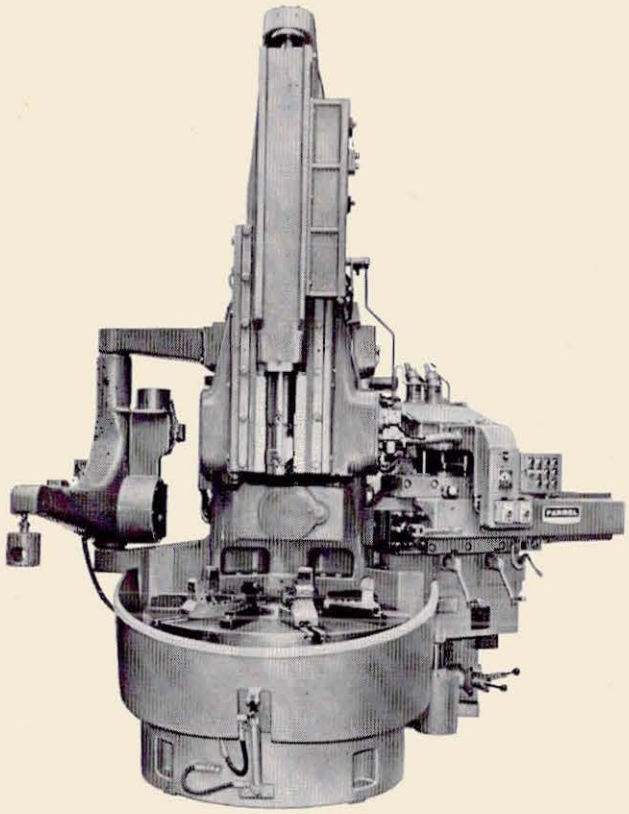
ALCOA

Circle 12 on coupon page 109



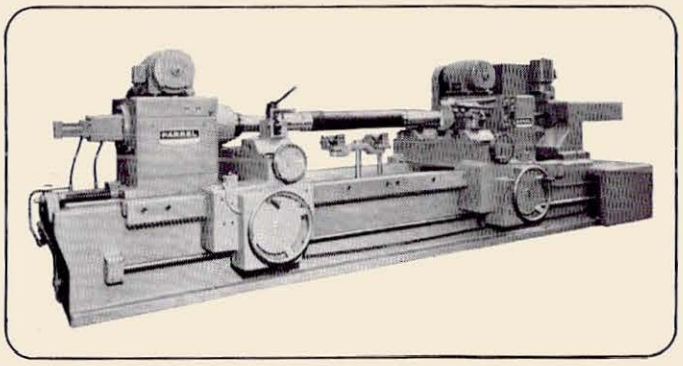
can reprofile at least two wheels in twenty minutes

Taking cuts up to 3/4" depth on both wheels simultaneously, this new 50" tracer-controlled wheel lathe is six times as fast as many old machines still in use. Operation is easy to learn. The design incorporates a straight-hydraulic tracing system requiring only four controls to cut the wheels.



performs 8 operations on diesel wheels

Farrel Diesel-wheel borers will rough-bore, finish-bore and chamfer in a continuous cycle . . . will face and turn both sides of the hub and face the flange side of the wheel rim . . . all with speed and accuracy. Wheels are automatically centered and chucked . . . boring is fully automatic from start to finish.



can turn and burnish at least 18 axles per shift

This dual-end drive journal-truing and axle lathe will (1) finish turn and burnish new or used, car or Diesel axles, (2) finish turn and burnish inside and outside journals of mounted wheel sets, and (3) turn center portion, between wheel seats, of straight axles. Speed range is suitable for carbide tooling.

productivity saves you money on wheel-and-axle maintenance

Farrel railroad shop equipment is designed to effect important savings in wheel-and-axle maintenance and manufacturing by raising productivity without adding to manpower needs. Look, for example, at the machines above.

Most of the Farrel line can be equipped with semiautomatic or fully automatic loading and unloading devices and with transfer and measuring systems. Each of the machines can be "sequenced" in operation with one or more of the others to improve accuracy and minimize further the manpower factor.

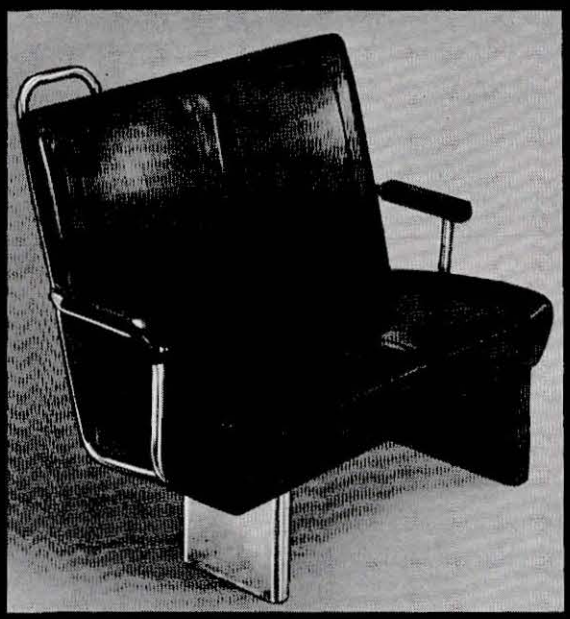
For more information about the Farrel complete line of wheel-and-axle machinery, send for bulletin 1400-A.

FARREL®

FARREL COMPANY
DIVISION OF
USM CORPORATION
RAILROAD EQUIPMENT SALES, DEPT. K5
565 Blossom Road, Rochester, New York 14610
Telephone: 288-4600 (Area Code 716)

FR-262

Circle 13 on coupon page 109



BE SEATED

by

Coach & Car

We have Designed, Tested, and Manufactured SEATS for more than half a century...for Transportation, Industry...Agriculture and the Military, and some of our seats have lasted as long as we have been in business.

TRANSPORTATION

FARM EQUIPMENT

ROAD BUILDING EQUIPMENT

TRUCKS

MILITARY VEHICLES

COACH & CAR

1951 Arthur Avenue • Elk Grove Village, Illinois 60007 • 312/437-5760

For years, we've been telling you Timken® "AP" bearings last longer. Now we guarantee the first 7 years.

Introducing the Timken "AP" bearing 7-year Parts Replacement Agreement.

PARTS REPLACEMENT AGREEMENT

THIS AGREEMENT is between THE TIMKEN ROLLER BEARING COMPANY (hereinafter called the "Company") and _____ (hereinafter called the "Customer"), and is made effective _____ 19___.

In consideration of the purchase by the Customer, on or after the effective date of this Agreement, of Timken® "AP" bearings, for use on railroad freight car applications, the Company hereby agrees as follows:

1. On any Timken "AP" bearing assembly purchased by the Customer during the term of this Agreement for use on freight car applications, the Company will replace or repair, free of charge other than any applicable inspection or service charge otherwise payable and Customer's portion of transportation, any of the parts specified in paragraph 5 below which, within 84 months of the original date of manufacture etched or stamped on the bearing, are found to be in such condition as to require replacement or repair to comply with the standards set forth in the Roller Bearing Manual of the Association of American Railroads as of January 1, 1969. If cup or cone surfaces show evidence of Brinell or fatigue due to normal wear or loading, to the extent that they are not suitable for continued service under standards set forth in the Roller Bearing Manual, the inspection charge otherwise payable will also be waived. If the Roller Bearing Manual should require, or the Customer should specify, that certain parts of the bearing assembly be replaced when the bearing is reassembled, even though such parts are in good condition, the Customer will be charged for the replacement of such parts.
2. The provisions of paragraph 1 above shall also apply, subject only to the 84 months' limitation, to any Timken "AP" bearings purchased by the Customer prior to the effective date of this Agreement.
3. To qualify for replacement of parts under this Agreement, the following requirements must be met, to the best of the knowledge and belief of the Customer and to the satisfaction of the Company:
   a. The condition requiring replacement must be attributable to the quality of material or workmanship in the manufacture of the bearing, and must not be due to damage from derailment, fire, immersion in or exposure to water.
   b. The complete bearing assembly (less axle end cap assembly) including all parts as removed from the axle for inspection must be forwarded to the Company, f.o.b. Columbus, Ohio, fully assembled, and with suitable packaging and/or blocking to prevent damage in shipment and handling, within 84 months of the original date of manufacture, as specified above, with identification of the Customer by or for whom the bearing is being forwarded.
   c. The bearing assembly must have been in use on a freight car operated and maintained in accordance with loading and other rules and standards of the Association of American Railroads for cars in interchange service.
   d. There must not have been any modifications or alterations of the bearing assembly, unless authorized in writing by the Company, nor any improper repairs or any substitution in the bearing assembly of bearing components made by another manufacturer.
4. Following inspection and repair or replacement of parts in accordance with this Agreement, the complete bearing assembly (less axle end cap assembly) will be returned by the Company to the Customer, f.o.b. Columbus, Ohio, subject to such freight allowances as the Company may from time to time establish applicable to all customers of the same class.
5. The bearing parts which are covered by this Parts Replacement Agreement are the cones, cup, cone spacer, seals, seal wear rings, backing rings and vent fittings. Other parts of the bearing assembly - axle end cap, cap screws, locking plate and lubricant fitting - are covered by the warranty referred to in paragraph 6 below.
6. This Parts Replacement Agreement supplements the warranty set forth in the "Conditions of Acknowledgment and Acceptance of your Purchase Order," under which the bearings were originally sold by the Company to the Customer.
7. Except as provided in paragraph 3d above, this Parts Replacement Agreement will apply where the condition of parts requiring replacement or repair has been found upon inspection either by the Company, or by the Customer or any other person for the Customer prior to the forwarding of the complete bearing assembly to the Company in accordance with paragraph 3b above.
8. In the event of any dispute concerning the qualification of a bearing for replacement of parts under this Agreement, the necessity for replacement or repair of particular parts, or any other question concerning the application of this Agreement, the decision of the Company will be final.
9. This Agreement is for a term of _____ months from and after the effective date, and may be extended for successive periods of twelve (12) months by notice in writing from the Company to the Customer. Following the termination of this Agreement, any bearing assembly to which this Agreement became applicable during its initial term or any extension will continue to be eligible for replacement of parts in accordance with the provisions hereof.

IN WITNESS WHEREOF, the Company has executed and delivered this Agreement to the Customer as of the effective date specified above.

APPROVED:

_____
General Manager - Sales or Assistant General Manager - Sales
Railroad Division
The Timken Roller Bearing Company

THE TIMKEN ROLLER BEARING COMPANY

By _____
District Manager, Railroad Division

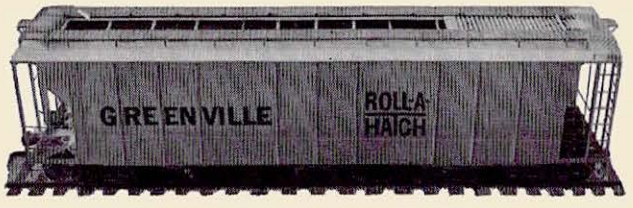
TIMKEN®
REGISTERED TRADEMARK
TAPERED ROLLER BEARINGS

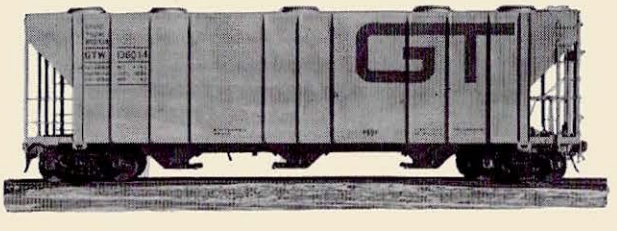
Circle 15 on coupon page 109

LOOKING FOR MORE TRAFFIC?

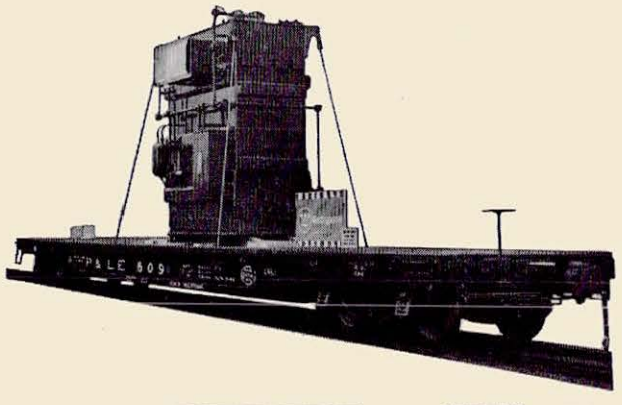
One of these Greenville cars may help you get it.

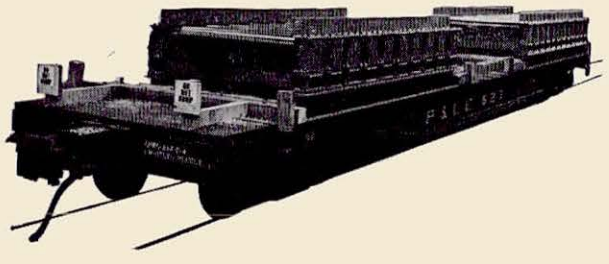
DRY BULK...





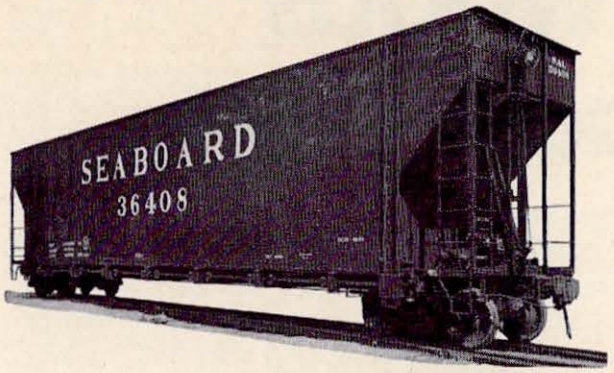
MACHINERY...

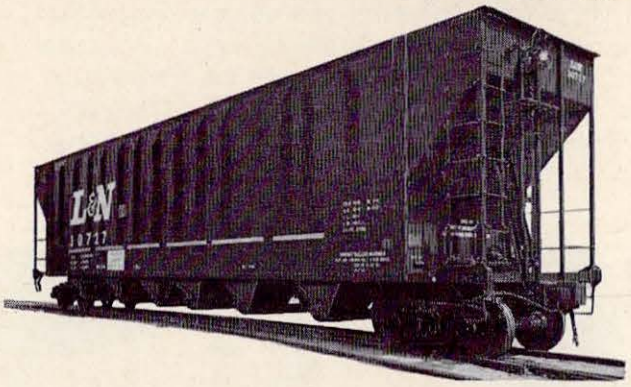




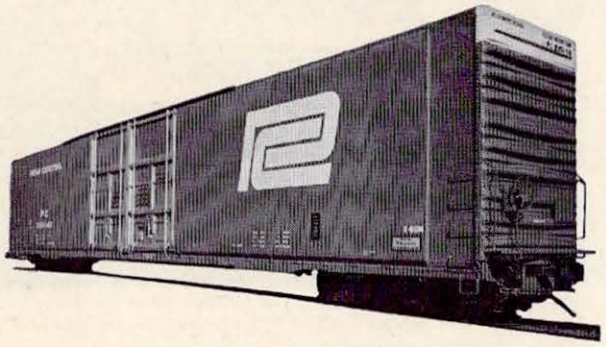
In any given year Greenville builds more kinds of cars than any other contract builder. Many are the first of a kind, selected as part of a concerted effort to win new traffic. As a result, Greenville can usually shorten the building cycle by modifying existing designs to help solve the problem at hand. An increasing number of traffic-oriented railroads include Greenville early in their planning sessions. The right cars can play a key role in your traffic development. Our experience can be important to you. Call us.

WOOD CHIPS...

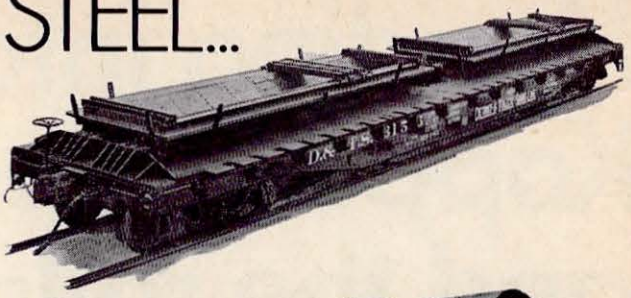


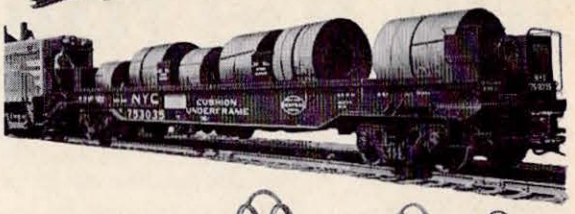


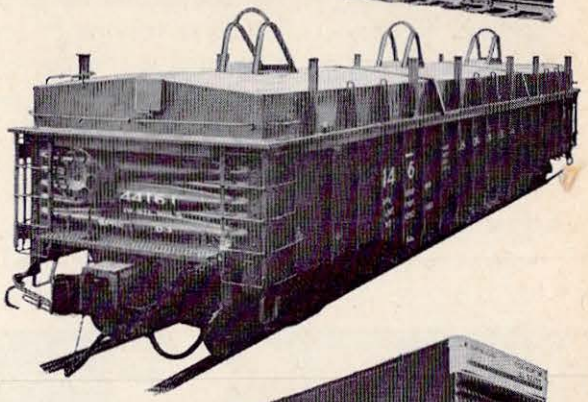
HIGH CUBAGE...



STEEL...







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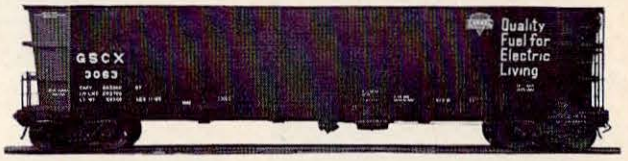
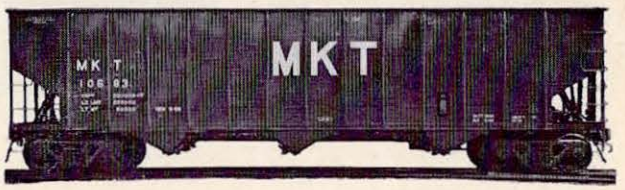




GREENVILLE **STEEL CAR COMPANY**
Subsidiary of Pittsburgh Forgings Company
GREENVILLE, PENNSYLVANIA

Circle 16 on coupon page 109

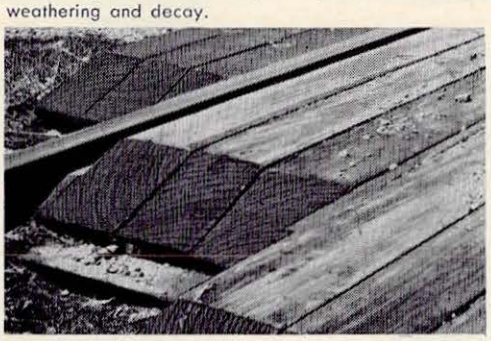
Heading into a new era: Koppers super woods and the railroads.

Moon shots and space-age technology aren't the only transportation advances being made today; American railroading is also undergoing revolutionary change. Koppers Company is very much a part of this change, working in the field and in the lab to explore new and useful ways for Koppers pressure-treated and laminated super woods to serve the railroading industry. Every year the list of Koppers practical contributions to railroading grows longer, including such applications as laminated Alger-Deck for boxcar decking and loading platforms; products for today's and tomorrow's intermodal containers; and glue-laminated structural members for construction of railroad warehouses and bridges. Railroading problems stimulate us to develop new ideas and solutions—they always have. But whether time-tested or brand-new, Koppers railroading ideas and innovations are always planned to reduce your transportation costs, keep your cars in service longer. We have your future very much in mind, and we think it's unlimited. Forest Products Division, Koppers Company, Inc.: 761 Koppers Building, Pittsburgh, Pa. 15219 or 122 South Michigan Ave., Chicago, Ill. 60603. MA-11

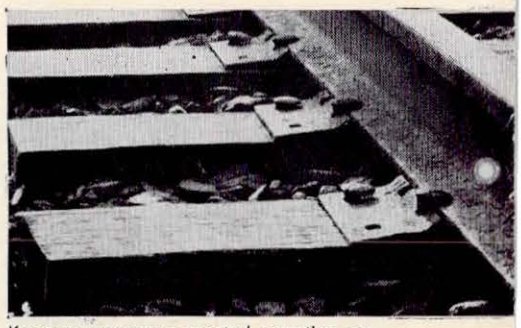
Koppers automated crosstie selection system can inspect up to 3,000 crossties per work day. The system unloads cars, end trims, counts, separates and arranges ties for stacking.

Laminated tongue and groove, 12" wide Alger-Deck was used to build this passenger loading platform of the Chicago Transit Authority . . . pressure-treatment by the Cellon® process provides protection against weathering and decay.

Alger-Deck made of laminated tongue and groove lumber is ideal for boxcar flooring. It's rugged, good looking, non-toxic . . . also resistant to rot, thanks to pressure-treatment by the Cellon® process.



Koppers prefabricated grade crossing panels are secured against shock and vibration. Easy to install, they don't sag, swell, washboard, shrink, spall or rust. Also, pressure-creosoted to prevent decay and termite attack.



Koppers pressure-creosoted crossties are unaffected by decay or insects. Will last for years.

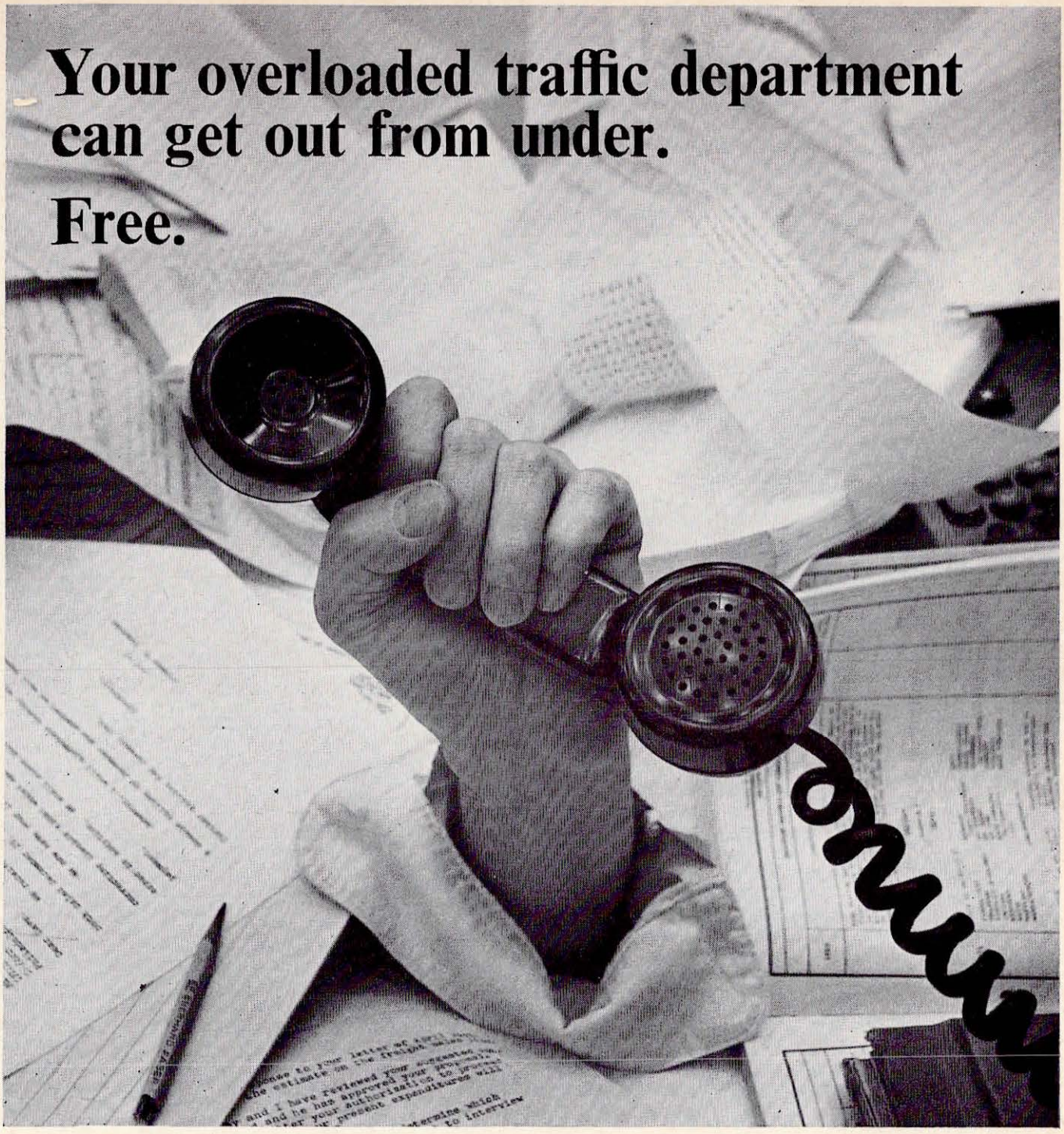
1869 1969
GOLDEN SPIKE CENTENNIAL

KOPPERS
Engineered Products

Circle 17 on coupon page 109

Your overloaded traffic department can get out from under.

Free.



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Perhaps you think the size of your business doesn't call for more than a shipping clerk. But you may still face problems that only a really seasoned traffic department can deal with.

Reading can lend you a helping hand in any or all phases of your total distribution concept. In transportation. Warehousing. Pricing policy. Even loading and unloading practices are sometimes affected by the shipping problems peculiar to your commodity.

You can call on the skills and the experience of Reading's Product Managers group for their advice and assistance. No obligation.

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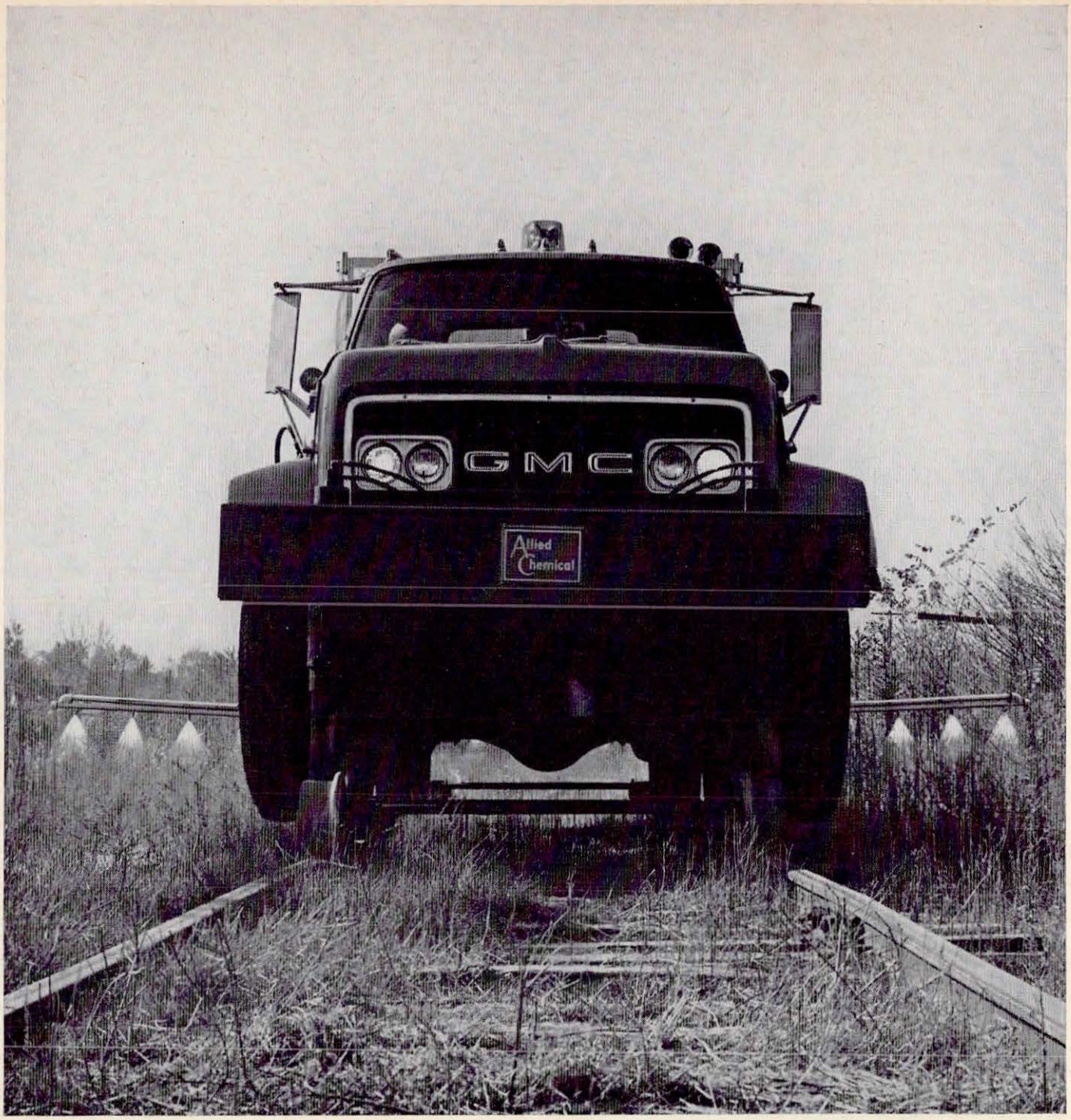
Reading Lines

READING RAILROAD

On-time delivery is our # 1 concern

Circle 18 on coupon page 109



Just give us a foreman and all your weed and brush problems. We'll handle it from there.

We start with our fast-moving Hy-Kill trucks. They hit right-of-ways, yards and other facilities with our Urox® Weedkillers. Urox wipes out grass and weeds, keeps tracks and ballast clean up to 18 months.

Your foreman is the only man we need to tell us where and when to go. Our men will take care of the complete job for you.

Either our efficient Hy-Kill trucks or our large-volume spray cars will handle your mainline work.

We have new multi-tank spray systems on both our Hy-Kill and spray cars. We can apply several different herbicide combinations, by simply pushing a button, to kill whatever weeds we encounter on your job.

Our tankers keep our equipment supplied, no need to tie up yours. After 25 years, there are few things we don't know about doing a heads-up spray job.

Just a phone call or a letter will get things started. We'll custom apply Urox weed and brush killers or any weed or brush killer you specify. For a bid quotation, write Department AG-RA, Allied Chemical Corporation, 40 Rector Street, New York, New York 10006.

Allied Chemical

Circle 19 on coupon page 109

aluminum cars are
the least expensive freight cars
you can own
(or lease)

Experience—and cost accounting —prove aluminum cars will actually cost less and earn more over their lifetime than steel cars.

You do pay a premium, initially, for an aluminum freight car. It averages about $4,000 over the price of a steel car. (A recent bid showed a spread of only $2,300.) But when you consider the total cost of the cars and their revenue-producing capacity over their service lifetime, there's no question that the aluminum car has a major advantage.

Basic, of course, is the lower tare weight and higher capacity of the aluminum car. A 4,750 cu. ft. aluminum covered hopper can carry 13,500 lbs. more payload than a typical steel car of comparable size. In cars ranging from 2,600 to 2,900 cu. ft., aluminum gives you a 16,000 lb. payload advantage over steel.

Extra Payload Pays Off

With this sort of payload advantage, it doesn't take many trips per month for an aluminum car to produce a sizable extra revenue. The following table shows how much added revenue an aluminum car can produce on two-turn-arounds per month, with various per-ton rates:

Added Revenue Earned By Aluminum Covered Hopper Car Over Comparable Steel Car—Based on 6¾ Ton Bonus Payload

Rates Per Ton	Revenue Additional Per Trip	Revenue Additional Per Month	Revenue Additional Per Year	Revenue Additional Per 15 Years
$ 1.00	$ 6.75	$ 13.50	$ 162.00	$ 2,430.00
2.00	13.50	27.00	324.00	4,860.00
3.00	20.25	40.50	486.00	7,290.00
4.00	27.00	54.00	648.00	9,720.00
5.00	33.75	67.50	810.00	12,150.00
6.00	40.50	81.00	972.00	14,580.00
7.00	47.25	94.50	1,134.00	17,010.00
8.00	54.00	108.00	1,296.00	19,440.00
9.00	60.75	121.50	1,458.00	21,870.00
10.00	67.50	135.00	1,620.00	24,300.00

Thus, at the end of 15 years, with two-turn per month service and a conservative grain rate of $4.00 per ton, the aluminum car will earn $9,720 more than the steel car.

Lower Operating Costs

Extra earning capacity, however, is just one of the long-term financial benefits that aluminum cars give their owners. Substantially lower operating costs is another.

Because it is 13,500 lbs. heavier on the empty return trip, a steel car travels more ton-miles than an aluminum car in the same service. Ton-mileage, of course, is directly related to operating costs. With less ton-mileage, an aluminum car will require less train fuel, less locomotive maintenance and lubrication, less maintenance of way.

Maintenance Slashed

An aluminum car itself requires much less maintenance than a steel car. Aluminum won't rust, so the car needs no protective painting. Aluminum also resists corrosion and protects cargoes from contamination, so expensive interior coatings are not required. Interior coatings or linings for steel cars cost about $700 per application, and must be replaced several times during the life of the car.

Reynolds economists have estimated that an aluminum open hopper or gondola car in unit train coal service would save over $4,000 in maintenance costs in a 20 year period. This is because the average steel car's side sheets, slope sheets, and crossridge sheets must be replaced at least once in 20 years of coal service; experience indicates this is not necessary with aluminum coal cars.

Extra Dividend in Scrap

There is one more major financial factor to be considered with aluminum cars: scrap value. At the end of its service life, a typical aluminum-body car will yield about 15,000 lbs. of aluminum scrap. (The aluminum car is really an aluminum-body car, with 15,000 lbs. or 30% of its tare weight being aluminum.) Conservatively, an aluminum car would be worth $2,200 more in scrap value than a similar steel car.

Total Cost Analysis

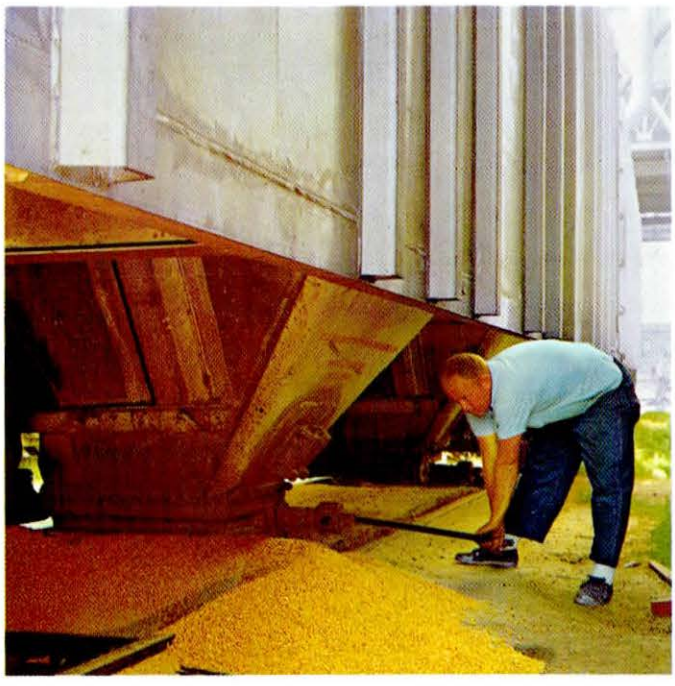
One railroad executive recently analyzed all these factors as they applied to 150 aluminum covered hoppers for general service. He found that the projected 15 year savings in operating costs, maintenance, and scrap value would completely cover the premium in first cost of the cars, and yield an extra savings of $97 per year per car. This study did not take the additional payload and revenue capacity of the aluminum cars into consideration.

Aluminum cars command higher per diem rates for off-line service, so their extra earning power is not limited to "captive" service.

Added Per Diem Revenue with Aluminum Cars

Year	Aluminum Car Value For Per Diem Per Unit (1)	Per Diem Rate	Steel Car Value For Per Diem Per Unit (1)	Per Diem Rate	Differential Per Diem Rate	Added Revenue For Aluminum Cars Per Unit Per Year (2)
1	$19,000	$6.15	$15,000	$6.15	—	—
2	18,430	6.15	14,550	4.50	$1.65	$ 297.00
3	17,860	6.15	14,100	4.50	1.65	297.00
4	17,290	6.15	13,650	4.50	1.65	297.00
5	16,720	6.15	13,200	4.50	1.65	297.00
6	16,150	6.15	12,750	4.50	1.65	297.00
7	15,580	6.15	12,300	4.50	1.65	297.00
8	15,010	6.15	11,850	4.50	1.65	297.00
9	14,440	4.50	11,400	4.50	—	—
10	13,870	4.50	10,950	4.50	—	—
11	13,300	4.50	10,500	4.50	—	—
12	12,730	4.50	10,050	4.50	—	—
13	12,160	4.50	9,600	3.58	0.92	165.60
14	11,590	4.50	9,150	3.58	0.92	165.60
15	11,020	4.50	8,700	3.58	0.92	165.60
Total						$2,575.80
Averages		$5.380		$4.426	$0.954	$ 171.72

(1) Straight line depreciation at 3% per year
(2) Assumed 180 off-line days per year



When a lease arrangement is preferred to outright purchase, Reynolds specialists work with the railroads and leasing companies to get interest rates comparable to—if not better than—those for steel cars.

If you're planning to invest in new freight cars, look at the total cost, the total earning power, of the cars. You'll see why more aluminum cars are going into service every year . . . more of them made with Reynolds Aluminum than any other.

The facts on the previous pages show how aluminum covered hopper cars reduce costs and boost revenue for their owners. Other types of aluminum cars offer these benefits, too: Open hoppers, gondolas, and tank cars all cost less to operate and maintain when they're made of aluminum—and have extra payload capacity, higher scrap value, as well.

The service records of these cars show that their day-to-day economies add up to long-term financial benefits.

Aluminum's light weight, strength, and corrosion resistance pay important dividends in car components and special freight equipment as well as in rolling stock—as proven daily by aluminum car doors, crossmembers, and bulkheads.

Let a Reynolds railroad specialist show you the long-term advantages of aluminum cars and equipment. Contact your local Reynolds office for details or write Reynolds Metals Company, P.O. Box 2346-XY, Richmond, Virginia 23218.

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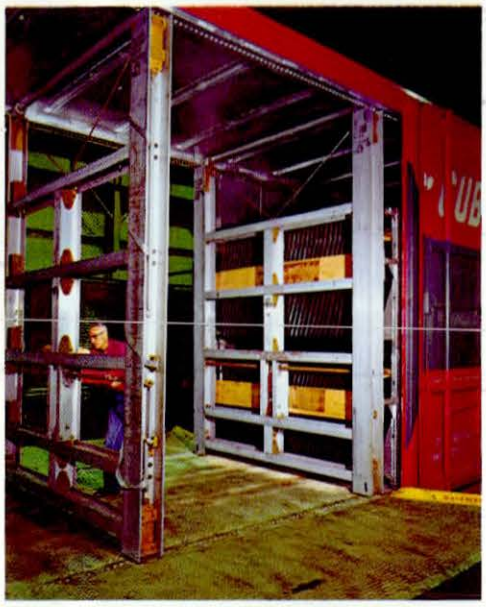
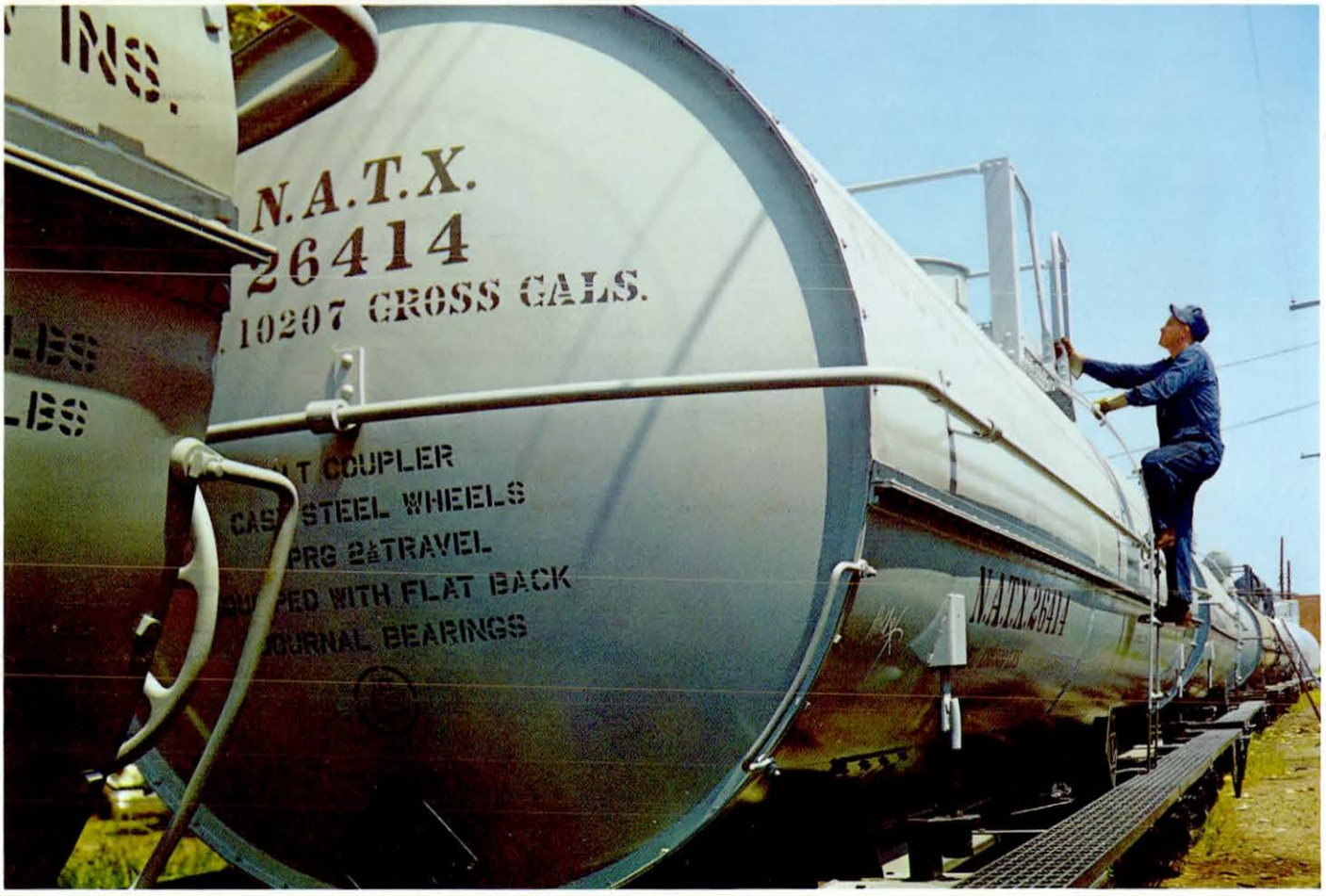
REYNOLDS
where new ideas take shape in
ALUMINUM



Gondola cars made with Reynolds Aluminum, in daily unit train coal service.

Strong, lightweight bulkheads of Reynolds Aluminum guard bulky freight.

Tough Reynolds Aluminum helps tank cars serve longer with corrosive cargoes.



THE GOLDEN SPIKE: 100 YEARS LATER

THE SECOND REVOLUTION IN TRANSPORTATION

The first great revolution in American transportation took place at Promontory, Utah, 100 years ago, when the rails of the Union Pacific and the Central Pacific met and welded a nation together. Today we are on the threshold of a second revolution: the welding together of railways, highways, airways and waterways into great, unified transportation systems capable of meeting the staggering demands of the future. In the years since Golden Spike, railroad problems have been more widely publicized than railroad progress; the gradual disappearance of the intercity passenger train has led to some premature obituaries. But while others have been grabbing the headlines, railroads have been quietly undergoing a technological and marketing revolution that has made them again a vigorous and restless growth industry. This year railroads will haul more tons of freight more miles than ever before, and will collect a record $11 billion for doing so. In these pages, the editors of Railway Age proudly describe these 100 years of progress—and what railroads have done, and are doing, to tool up for the greater task ahead.

Luther S. Miller

EDITOR

TOOLS OF REVOLUTION

ROADWAY TO THE FUTURE

The foundation of tomorrow's transportation is in place today. Made of steel and wood and concrete and crushed rock, it's the guideway called railroad track, two steel rails 56½ inches apart, linking together all parts of a nation and providing a steel channel for the nation's commerce.

To look back at yesterday's railroad—the railroad of Promontory days—is, in fact, to look ahead. To look back at the changes which turned yesterday into today is, perhaps, to get some gauge on the kind of change railroads can be capable of in coming decades.

A railroad civil engineer today, contemplating the methods used to build railroads a hundred years ago,

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must feel at least a twinge of pity for his counterparts of that era. This would apply all the way down in the organization to the point where the operator of a modern rail-laying machine, sitting comfortably at his control station, is confronted with a picture of the sweating, straining rail handlers in the track-laying gang of a century ago.

It was raw, human muscle that built the first transcontinental line. Horse-drawn scrapers, crude winches and black powder were the only "power-driven" aids, except for the steam locomotive, that human ingenuity had been able to contrive at that time. The main tools of track-laying crews were the shovel, the spike maul, the hand wrench, the claw bar, the lining bar, the hand adz and rail tongs. Even rail tongs were not always available—there is photographic evidence that rails, at least some of the time, were carried forward in the bare hands of the workers.

"CAUGHT UP IN THE SPIRIT OF A GREAT ENTERPRISE"

But any feeling of pity for these early track-builders would almost certainly be wasted. A driving desire to get the job done was a force that the men at the top were able to communicate to the entire organization. Sure, the laborers were working for a wage, but that wasn't all. There had to be something else. Why else would a crew of Chinese laborers on the Central Pacific drive itself to rack up a record of 10 miles of track laid in a day, from sunup to sundown? Why, when the average daily output of track built was one to three miles?

The answer lies partly in the fact that the Chinese had a bit of competition going with the predominantly Irish crews that were building the Union Pacific. And the Irish, who could achieve only 8½ miles of track in a single day, are reputed to have cried "foul," perhaps because the Chinese had craftily done considerable preparatory work in advance.

The spirit of competition was part of it, of course. But published reports of those early railroad builders picture them as being a brawling, hardy breed, caught up in the spirit of a great enterprise. They as individuals identified themselves with an organization that was building the first transcontinental railroad. And all the hardships imaginable—heat, cold, snow, primitive living conditions, hostile Indians and a terrain that sometimes was almost impossible—were simply nothing more than part of the day's work. The ultimate goal—the closure at Promontory or at whatever point—was the big thing. Pity indeed!

Are not the seeds of a similar spirit present today as the railroads, having shaken off the past, look forward to the next hundred years? Could they not set for themselves a goal that would rival in significance and importance the goal they pursued with such single-mindedness a century ago? Is not that new goal logically the creation of a vast new multi-modal transportation complex built around a railroad industry that has justified its claim to a keystone position by having converted itself into the world's most efficient transportation machine?

Attainment of the goal won't be easy any more than construction of the first transcontinental rail line was easy. But with the help of the same spirit that motivated the early railroad builders, the fabricators of a new integrated transportation industry would find their goal within reach—and long before another century has passed.

It's technology, at least in large part, that is giving the railroads the muscle they will need for their new role in the transportation picture. And no better illustration of that muscle is available than through a comparison of modern track and track-building practices with those in use when the first transcontinental line was being built. What makes the comparison a striking one is not that the early builders were inept. Far from it. They were superbly skilled in the use of the tools available to them. It's just that the tools available today are so much more advanced than they were in those days.

These advances include the tools used in locating new railroad lines. The early locating engineers, travelling by foot or on horseback, painstakingly sought out the most promising route. But their main tools were the surveyors' chain, the transit, the rod and the level. If these same engineers had the tools that are available today, they would have gone into the field only after the location had been established through aerial photography and the science of photogrammetry, which relieves the field parties of everything except setting the final grade and line stakes.

The final location of the Union Pacific and the Central Pacific would thus have been accomplished much faster and quite probably on more favorable grades and alignment. And, doubtless, Promontory would not be the scene of the Golden Spike Centennial ceremonies.

If a line from Omaha to Sacramento were being located and constructed today, it's certain that the builders would use "super-railroad" specifications. The crude, costly and slow methods of grading in use a century ago required that the lines be built with a minimum of grading. No such limitation would apply, or could be tolerated, today. Modern earth-moving equipment, and more efficient and precise methods of blasting out rock cuts or constructing tunnels, have taken care of that.

Freed of the old limitations, designing engineers

could set their sights on a line having (except possibly in mountain districts) ruling grades of 0.5% and maximum curvature of 30 minutes. Fills would be higher, and cuts would be deeper, but economically they could be justified. And who knows but what nuclear explosions would be used to blast cuts straight through mountain ranges?

The changes that have taken place in the economic relationship between embankments and bridges would certainly result in fewer or shorter bridges being built, in favor of earth fills. And certainly the spindly-looking timber trestles of the original lines would be replaced either with embankments or with modern concrete or steel bridges.

In designing the track itself, the engineers would keep in mind several requirements. One, of course, would be the need for track capable of carrying modern loads at high speeds. Another, equally important, would be the need for a structure capable of holding its line and surface for a long period of time, thereby reducing maintenance costs.

With about 1,700 miles of line to be built, the engineers would certainly select their track specifications with the greatest of care. As Japanese engineers did with the New Tokaido Line, the American engineers might even elect, after extensive laboratory work and field testing, to adopt a type of track support entirely different from that in common use today. Possibly it would have concrete slabs or longitudinal beams under the rails. Or the ties might be of concrete, using one or more of the types available today.

TODAY: HEAVIER RAIL THAT IS SMOOTHLY WELDED

However, if the line were built in accordance with specifications in common use today, it would have rail weighing at least 115 pounds per yard, supported with double-shoulder tie plates on creosoted hardwood crossties embedded in crushed-stone ballast. For riding qualities and economical maintenance, the rail would most certainly be welded into continuous lengths, probably a quarter-mile long, before being placed in the track. The rail would doubtless be fully-spiked on curves and anchorage would be sufficient to restrain it from longitudinal movement. The long strings would be joined by field butt welds so that the lengths of continuous stretches of rail would be limited only by the presence of insulated joints or switches.

Such construction would be a far cry indeed from the track that was built a century ago. Its main characteristics were 50-pound or 56-pound iron rail in 30-foot lengths, crossties that appear in some cases to be merely parts of logs with the bark still in place, and dirt "ballast." Such refinements as tie plates and stone ballast were still years away.

The contrast between the methods of track construction used a century ago and those that are finding favor today are striking. Accounts of early track-laying work depict scenes of feverish activity with hordes of men participating. All told, a track-laying gang of that time might include 1,000 men and 100 teams of horses, some used to pull push cars loaded with rails and other track materials. Foremen frequently directed the work from horseback. The tamping crew made up the largest single unit in the track-laying force. Four-hundred strong, the tampers did their work with shovels and tamping bars.

By comparison, the methods in use today for building new track, being highly mechanized, require only a handful of men. For distributing the ties on the subgrade ahead of the rail-laying operation, today's organization might employ a self-propelled machine, called the Tiematic, which the Southern Pacific developed for use in the construction of a cut-off line 78 miles long. This machine, manned by an operator and two men, takes crossties from bundles, applies two tie plates to each tie, drives a single spike through each tie plate into the tie, and deposits the ties on the subgrade at the correct line and spacing.

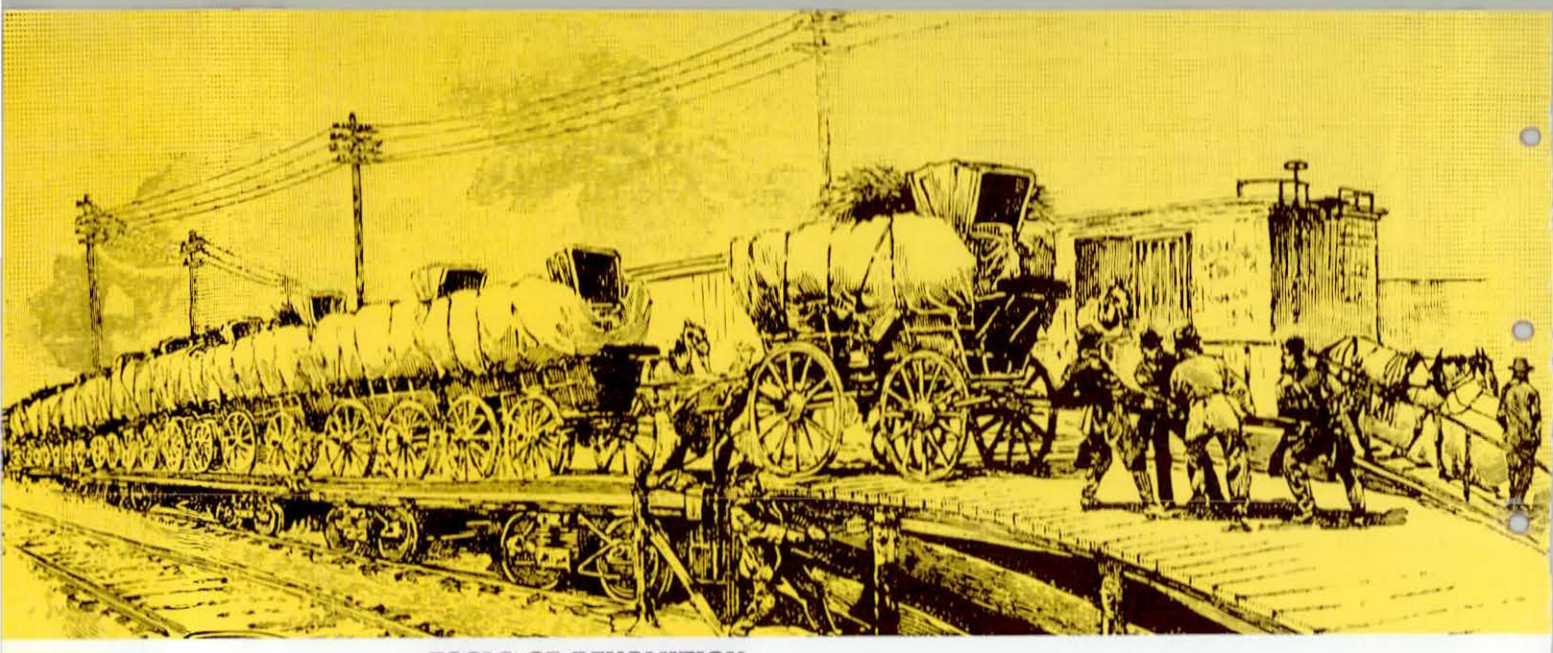
The lengths of welded rail would be delivered to the rail head by the trainload, each load comprised of at least 40 strings—sufficient rails to build five miles of track. A rubber-tired crane, straddling the ties on the subgrade, would grab the ends of two rail lengths at a time and pull them off the train onto special rollers placed on the ties. When the two rail lengths are resting on the rollers for their full length the rollers would be removed and taken ahead for the next pair of rails.

Behind the rail train the track would be fully spiked and anchored, again using highly mechanized units. Ballast would be unloaded to permit the track to be raised and tamped in successive lifts by one-man automated machines possibly tamping two or even three ties at once. The last of these machines, equipped with an automatic lining device, would put the track in final line and surface.

Total manpower requirements for the track laying, ballasting, raising, tamping and lining would come to not more than 80 men, and the daily output of finished track would approach three miles. That's with machines and techniques available now. And who knows what the next big breakthrough might be?

So there is a prescription for the success of the railroad industry in the coming century: Take the technological knowhow of 1969, and combine with it a liberal portion of the spirit and drive of 1869. Are there any obstacles that could not be overcome by this combination?

—Merwin H. Dick



TOOLS OF REVOLUTION

THE JOB DOESN'T CHANGE:

THE CARS DO

Phrases like "multi-modal" and "multi-level" are fully as significant to the coming century's transportation patterns as were "trans-Missouri" and "trans-continental" a century ago. In 1869 it was the railroads' fixed plant that was undergoing dramatic expansion in order that the nation's far-flung territories could be united and served. In 1969 it is the mobile property—the cars and the locomotives —which are undergoing the rapid transformation that can bring a new cohesiveness to America's diverse transport modes.

Actually 1969's multi-modal concept which can see 1800 new automobiles (below) or upwards of 200 trailers and containers moving in a single freight train is not new. Even the line-haul segment of the journey of a nineteenth-century prairie schooner (left) was often performed most efficiently

when it was done by rail. But do the freight car and locomotive have a role in an era when the competition is not the horse-drawn wagon but the supersonic jet, the double-bottom highway hauler and the "Big Inch" pipeline?

The inherent advantage of the rail mode is the guided movement that gives railroads the ability to outproduce their transport counterparts by almost unbelievable ratios. To move 100,000 tons of freight between New York and San Francisco takes 43,417 man-days by highway, 11,158 man-days by water, and only 3,320 man-days by rail. The actual surface contact of a steel wheel on a steel rail is only about the size of a dime. By contrast, the flexing of a rubber tire as it flattens over a broader area is such that it takes 7½ times as much force to move a comparably-loaded rubber-tired truck on a highway as it does to move a steel-wheeled railroad car on steel rails. It even takes four times more force to move a hull of comparable capacity through water. A century ago the spread between the railroad and its overland competitors was even more favorable.

THE "LONG" (33 FT) CAR OF A CENTURY AGO COULD CARRY 18,000 POUNDS OF LADING

The freight cars which had borne Union Pacific and Central Pacific construction materials to the rapidly advancing railheads in the late 1860s were of designs which had been in existence for over 20 years. A few years earlier the superintendent of an Eastern line had reported: "Whether the present plan of construction of cars is the best adapted for the cheap and safe transportation of freight is very questionable. A long—or eight-wheel—car is 28 to 33 feet in length, weighs, including the trucks, 16,000 pounds, and is permitted to carry 18,000 pounds of lading. This load, in addition to the weight of the box, is carried by two bolsters, each resting on a center bearing or pivot. The weight being so great upon these two points renders it difficult to construct bolsters sufficiently strong to carry the weight without bending." Car department officers can take a modicum of comfort in the fact that bolsters and center plates were already in trouble 114 years ago! And while the unfavorable tare-to-payload ratio in the 1855 wooden box car had discouraged its operator, attempts to produce the first iron cars during the Civil War resulted in even poorer ratios. It was five years after Promontory that steel in the form of channels for sills and bolsters was introduced to carbuilding.

TWENTY-FIVE YEARS LATER, THE FIRST STEEL CARS

By then the effects of larger locomotives and power braking were resulting in longer trains which necessitated greater longitudinal strength in cars. By the late 1870s, the result was an unchanged payload ratio with box and cattle cars of 20,000-pound capacity weighing 18,000 pounds empty. The wooden eight-wheel coal cars of this period weighed 13,400 pounds and carried 22,400 pounds. About 1880, a pioneer iron hopper car was developed which weighed 12,800 pounds and had a capacity of 26,000 pounds. It was exactly a quarter of a century after Promontory that Carnegie Steel Co. built six steel flat cars. In 1897 the first order for 40-ton steel hopper cars was placed.

When steel cars came into existence, the cast-iron wheels of the period proved inadequate and shortly thereafter the forged steel wheel went into production. The evolution of car components, and even of complete car designs, was carefully guided by the Master Car Builders (MCB) Association, first industry organization to appreciate the problems involved in operating the early American railway network as a system. From its founding in 1867 through its evolution into today's Mechanical Division of the Association of American Railroads, there has been a unifying influence on matters concerned with car construction and car repair.

Soon after its founding it was sponsoring development of the automatic knuckle coupler, pushing application of the automatic air brake, and standardizing car parts so that, for instance, 58 different axle designs were cut to five standard types. Only a

dozen years after Promontory, the head of MCB was warning members that "the rapid increase in cars with the large variety of parts used in their constructions shows a want of harmony in the ideas of master car builders as to what constitutes the most economical mode of construction and leads to many evils with no end of annoyance, delay and expense."

Growing standardization was accompanied by a steady upward trend in capacity. Through the first two decades of the twentieth century the American freight fleet increased by 54% to 2.4 million cars while its aggregate capacity went up 250%. The following years were then marked by the first major acquisitions of 70-ton cars; the 1930s saw the 90-ton car enter general interchange service.

For 75 years after Promontory, during which railroads performed virtually all overland freight transportation, America's shipping requirements were met with a minimum of basic car types. In such a period, the subtleties of payload ratio, density/cube relationship, and maximized utilization were not the make-or-break factors into which they have since developed. Transportation had not been confronted with what has lately become known as "environmental control" which encompasses, along with shock and vibration protection, such things as temperature, humidity and atmospheric regulation.

IN THOSE GOOD OLD DAYS, CUSTOMERS WEREN'T CRANKY

Upward traffic trends and the low-cost cars of that period meant that railway equipment did not have to be utilized efficiently to assure railroads a reasonable level of economic return. Railway customers of that less sophisticated period were not overly concerned with the costs of loading and unloading, the costs of bracing loads for shipment, and the expense of inventory in transit. Loss and damage were an accepted factor in the movement of goods. Railroads could concentrate on efficient ton-mile production, often to the detriment of the service they offered.

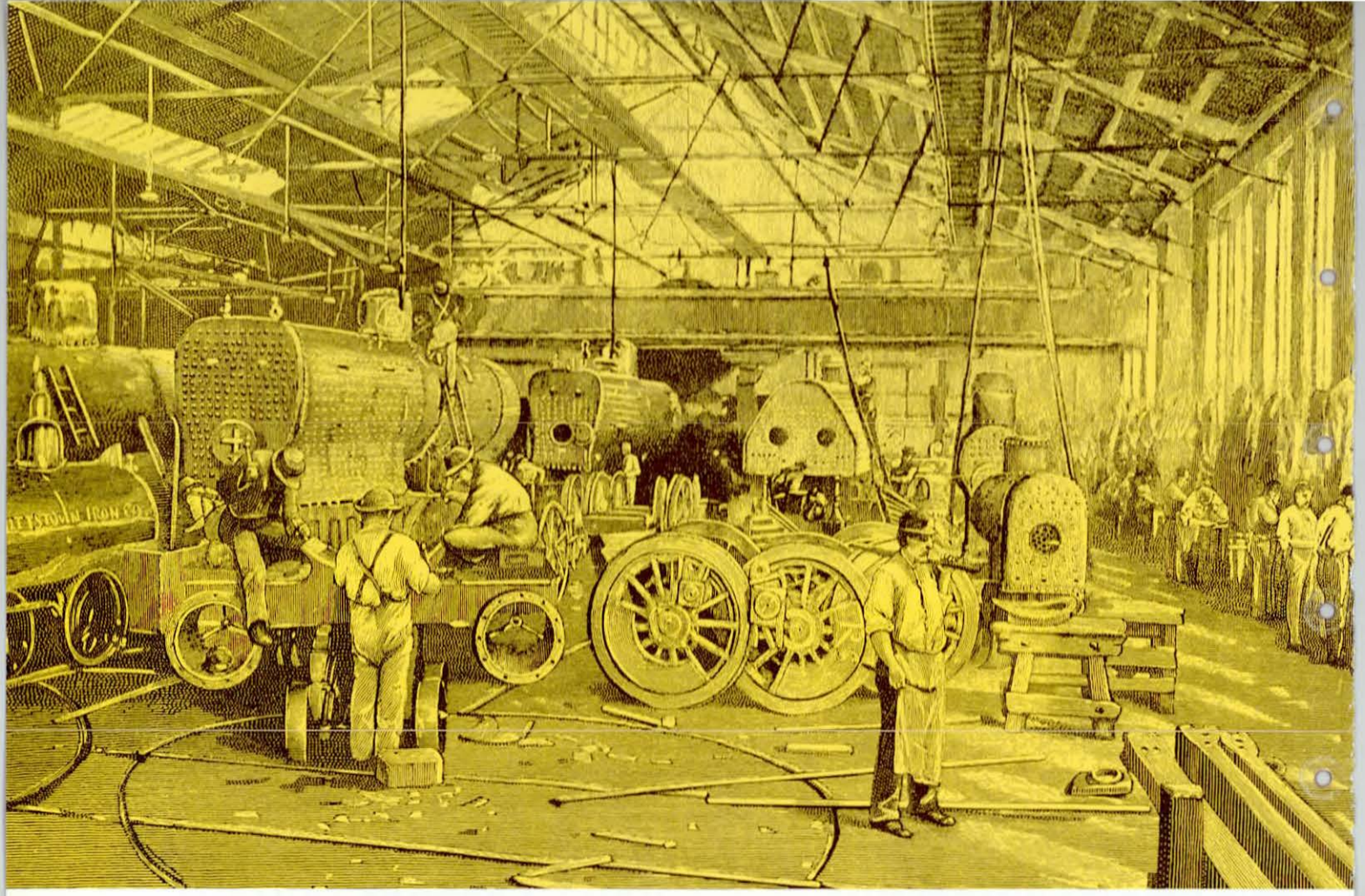
One observer of the transportation scene has recently predicted that the role of the rails in the coming decades could be primarily the movement of the products of the mines and forests—mainly the raw materials of our economy. Certainly the carriers are developing techniques to do this job more effectively—jumbo tank cars, Big John covered hoppers, the unit train. For such traffic in volume, the concept of the individual car seems destined to evolve into an articulated train, incapable of being divided into individual units for handling to multiple origins and destinations. What is inevitable in almost any event, will be a relaxing of the design restraints involved in complete car-fleet compatibility. At some sacrifice in today's complete interchangeability, there may be dual standards in the industry.

TODAY, CARS ARE TAILORED TO THE EXACTING NEEDS OF A PARTICULAR SHIPPER

Already there are two levels of longitudinal protection—traditional draft gears for rugged ladings and elaborate cushioning systems for fragile freight. The industry may soon have to adopt two types of running gear—one style for operation at low speeds and a new and more sophisticated arrangement for the higher freight-train speeds which are inevitable. The industry's automatic coupler is now being examined with the assignment of making it compatible with a new era of railroading, possibly at some sacrifice of complete compatibility.

Like car components, cars themselves are being increasingly tailored to do specific transportation jobs. Even the lowly flat car, once the epitome of the general service vehicle, has lost this role as, in special configurations, it transports containers, trailers, automobiles, farm machinery, wall board, coil steel, airplane parts, and rocket propellants. These hardware advances, combined with "software" improvements such as Automatic Car Identification and computerized maintenance records, can preserve the railroads' ability to be competitive across the entire transportation spectrum. Increasingly this will not mean meeting, or beating, the competition, but evolving systems which make rail and other modes partners—truly multi-modal transport.

—Fred N. Houser



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UNION PACIFIC

TOOLS OF REVOLUTION

POWER TO SPEED TOMORROW'S COMMERCE

A century ago it was power and speed unrivaled in other transport modes that characterized the American railroad. In the century ahead there is the potential for using the nation's increasingly scarce natural and manpower resources more effectively than is possible in any other form of transportation. Whether tomorrow's traction be in the form of locomotives, as it has for 140 years, or in the configuration of individually-powered vehicles (the electric Metroliners are a prime example), there is a fuel economy about the rail mode that is tough to match.

While the ceremony at Promontory just a century ago marked the beginning of a new railroad era, the locomotives pulling the two trains essentially represented an era of motive power that was ending—not beginning. Already on the American scene were a growing number of specialized locomotives which shortly were to displace the general service American (or 4-4-0) type from many of its traditional assignments.

So it is in 1969. Even the 5,000-hp Union Pacific diesels pictured in these pages, themselves representatives of growing specialization in diesel motive power, have just lost their ranking among America's

most powerful locomotives. UP is taking delivery of new 6,600-horsepower units.

This trend was predictable—more power, more specialization. It was happening a hundred years ago; it is happening today; it can be expected to continue to happen. While the general concepts of the relatively new 4-4-0 Central Pacific "Jupiter" and 4-4-0 Union Pacific "119" (both built by Alco predecessor companies in 1868) were destined to be duplicated (in declining numbers) for three more decades, Angus Sinclair sets 1870 as the peak of popularity of the American type with 85% of U.S. motive power then of this wheel arrangement. What was ending was the idea that a single type of locomotive was adequate for the passenger trains, freights and switching assignments of a growing nation where each of these operations was being transformed into something very specialized.

From its development 30 years earlier, the 4-4-0 locomotive had been well suited for all services. Its flexible suspension enabled it to operate well over uneven track. The locomotive had relatively few, easy-to-repair parts and was low in first cost while being relatively powerful. Smithsonian Institution's John H. White, Jr., has identified it as "the national engine, a machine without peer in this country because it answered every need."

THEN: CONSERVATISM AND RESISTANCE TO CHANGE.

Initially American railways had relied on the pioneer, but sophisticated, steam locomotives turned out by British builders—units which were designed for the carefully engineered and well constructed railways that were being put down in Britain. Conditions in America, including a shortage of investment capital, demanded a less sophisticated engine of greater power, durability and stability. Soon the 4-4-0 emerged as the motive power which could best be operated successfully on the poor track of that time and operated despite the poor maintenance facilities, untreated water and incompetent enginemen of those early years.

Domestic builders were soon producing these flexible, cheap machines in volume. White cites the requirements of U.S. locomotives in the mid-nineteenth century in order of importance: Flexibility, simplicity, power, low initial cost, and ease of maintenance. Fuel economy was definitely a secondary consideration, although the transition from wood to the more efficient coal was already under way in 1869.

Commercial locomotive builders, from the beginning, were responsible for most of the significant American design reforms. Generally, however, nineteenth century locomotive building was characterized by conservatism and resistance to novel designs. Until 1900 it was possible to increase locomotive capacity satisfactorily simply by increasing boiler and cylinder size, or by raising steam pressure. This simple, straight-line development reached its limit about 1900 when the era of the superheater, booster and stoker began.

From its earliest days, with the benefit of respectable track, the American locomotive had been capable of speeds up to 60 mph. Within 25 years after the Golden Spike ceremony, one would attain a speed of 112.5 mph.

Half a continent back of UP 119 that May 1869 morning was evolving the mechanism which was to have as profound an effect on railroading as designers' attempts to increase locomotive output. Just a month prior to the Promotory ceremony, a young Pittsburgh, Pa., inventor had received the world's first patent for the air brake.

George Westinghouse's invention climaxed 40 years of attempts by engineers and inventors to stop trains by means other than muscle power; its principle continues in use today. While Westinghouse had seized upon the transmission of compressed air (after reading of the powering of rock drills in an Italian tunnel), the railroad industry had really been introduced to the transmission of power and control signals from a remote point to all the units making up a train. By 1880 it was current for electric traction; by the 1890s it was electric signals for multiple-unit control; by the 1920s it was inductive signals for train protection; in the 1930s it was radio for train communication. The groundwork had been laid for railway automation.

The most serious shortcoming of the 1869 straight air brake was the loss of braking power and control when a train separation occurred. This was recognized early and led to the development of the Westinghouse automatic air brake system in 1872. The expression "fail safe" had become a railway industry by-word. The air brake immediately made possible the operation of longer, heavier and faster trains. That trend has continued to the present; with the continuing refinement in control techniques it, if anything, will accelerate in the years ahead.

While their immediate effects on railroading were minor, the two most significant motive power developments of the century after 1869 took place within less than 30 years following the driving of the Golden Spike. By 1880 Thomas Edison was pushing his pioneer work in electric traction; by 1897 Dr. Rudolph Diesel had built his first successful compression-ignition internal combustion engine in Germany. It would be 1925 before there was a real marriage of these American and German technical developments, resulting in the first commercially successful diesel-electric locomotive. In the meantime, the technology of the straight electric locomotive was being refined.

NOW: EXPERIMENTS WITH NEW TYPES OF POWER.

There was a stage in dieselization of the American railways when the 1500-hp, four-motor unit constituted a breed of locomotive almost as numerous, relatively, as the steam 4-4-0s had been at the time the Jupiter and 119 met in Utah. This new American type, however, was destined for a much shorter period of supremacy. Soon the motive power evolution shoved single-engine unit ratings to 1800, 2000, 2500, 2750, 3000, 3300 and 3600 horsepower. By early next year there is to be a single-engine, 4000-hp unit operating in North America . . . and more are in prospect.

Although the dual-engine diesel unit emerged in the earliest days as a solution to the need for high power, it has had relatively few advocates except in passenger service. Union Pacific has been the principal proponent of the highest-power-per-unit possible and its 6600-horsepower Centennial model is the latest (and largest) dual-engine design for freight service. For nearly 20 years this railroad fostered development of the gas-turbine-electric locomotive as a solution to the quandry of attaining power ratings approximating those of its final 4-6-6-4 and 4-8-8-4 steam locomotives. The rising cost of low-grade liquid fuels has recently acted to make UP's big turbines as uneconomical as their oil-fired steam predecessors and all American attention is again focused on the diesel.

The fuel economy of the diesel engine in freight service seems to render it invulnerable to inroads of other prime moves . . . with one possible exception. Faced with the same rising fuel-cost trend which has already side-tracked the gas turbine, railways are showing increasing interest in (but so far no commitment to) full electrification. In decades ahead when national policy may establish the patterns for consumption of energy and control of atmospheric pollution, railroads could emerge as the consumers of central-station-generated electric power distributed by catenary to completely smokeless motive power units. The consumption of fossil fuels would be left to the air and highway modes which seem far less capable of utilizing energy produced by nuclear power stations. The major investment represented in the catenary for railway electrification is a quandry which so far goes unresolved.

Fully as significant as the fuel economy of the diesel-electric locomotive have been the changes in operating, maintenance and servicing practices which accompanied its introduction. The electric transmission and multiple-unit concept make it possible for a single engineman to regulate the development of virtually any tractive effort which is needed, thus eliminating many traditional steam practices such as double-heading and helper districts for surmounting grades. Completely gone is the once-complex problem of locomotive water supply, particularly troublesome in arid territories such as that where the Golden Spike driving occurred.

PULLING THE RAILROADS INTO THE 21ST CENTURY.

Locomotive manufacturing and maintenance facilities have been transformed from job shops to full scale production lines. Component replacement and unit exchange have completely altered the philosophy of locomotive repair. Currently locomotive maintenance is undergoing a transition which might be described as "having the maintenance program manage the engine, rather than having the engine manage the program."

Spectrographic analysis of crankcase oils, radioactive analysis of engine component wear, automated diagnostic testing, and computerized locomotive component records are giving motive power managers the real power to manage. These tools promise to go far in depriving the locomotive of its "prima donna" status in railroading. What is emerging is the predictable, productive power source necessary to pull the railroads through their next century.

—Fred N. Houser

TOOLS OF REVOLUTION

COMMUNICATIONS FOR SPACE-AGE RAILROADING

What a difference a century makes.

Back in 1869, telegraph was the one means of fast communications. The agent-telegrapher, no matter how far out along the line, could always be in quick—and in those days almost instant—contact with headquarters, the division offices and usually the dispatcher. Telegraph did a fine job then; it does now, although by using a typewriter keyboard, messages can be sent much faster than using the old key and sounder method. And the old-time telegrapher probably wouldn't believe some of the other communications tools now serving the industry.

Railroads have progressed much in the 100 years since the nation was linked by rails on that May 10, 1869. One of the evidences of the years of progress: Development of the digital computer—a machine that just sits, hums and does literally millions of routine, repetitive jobs without complaint. Its one drawback: It works only when told to and does only what it is told. It can't think. So, in the 100 years since the Golden Spike was driven, that agent-telegrapher—now he may be an agent or agent-operator—has had a many-fold increase in his ability to communicate. He can now have literally the entire railroad at his fingertips. The vast storage capacity plus the almost instantaneous information-retrieval capabilities of the computer enable this agent out on the line to get almost any information he needs or wants.

With only the telegraph, the agent was really an order-taker. He took orders from customers and

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from headquarters—dispatchers and superintendents. Now he is a manager. At his instant grasp via today's tremendous communications capability are the facts with which he can intelligently manage his area of activity.

The next 100 years of railroading will truly see a revolution in the way things get done, in how railroads operate, in what people can do. The tools of this managerial revolution are here, right now, in 1969.

There will be some breakthroughs and undoubtedly some startling developments not now foreseen. But the basic tools are here. Computers will no doubt increase in capacity to calculate, compare, sort, tabulate and correlate data. With the increase in calculating ability will come a similar marked increase in storage capacity and a great shortening of time required to calculate and retrieve information. Techniques in miniaturization will make it possible for the truly desk-size computer to become a standard device for a manager's office.

Communications links will be expanded in capacity and speed so that from the desk-size computer to the large-scale mammoth in the general office, there can be direct links. Computer-to-computer communications will be commonplace. Also, the man-to-machine links will be greatly expanded.

Railroad managers at all levels—from the agent or supervisor along the line to the supervisor or department head in the general office—will be better able to manage because of the computer communications links including the man-machine links drawing all together into a unified whole.

QUALITY CONTROL REQUIRES INFORMATION INTERCHANGE

Railroads are now well along the road toward unified control of their operations. But most of the progress is spotty, with no one really to a point for resting on laurels. In general, the control picture is good, but there is much to be done. Consider the communications area: While several railroads have system-wide microwave networks, there are others just starting to install this bulk-communications facility. Until all roads have the bulk-communications capability, individual roads will be compartmentized or fragmented. Communications between railroads must be as easily obtainable as freight cars are in moving from one road to another. True quality-control of operations will require nothing less.

To achieve such control, the amount of communications in terms of equipment and facilities will be staggering. Right now, outside of the military and the telephone and telegraph companies, railroads are the largest communications users. Communications usage in the next 100 years will border on the truly fantastic. For man-to-man, there will be the telephone and radio for voice communications. But these will be supplemented by various types of graphic systems enabling a man in his office to write or draw pictures for his listener on the other end of the line. Data transmission will include today's techniques with refinements which will make the terminal equipment smaller, easier to maintain and more reliable.

For the bulk-communications facilities required for man-to-man, man-to-computer and computer-to-computer contact, microwave is the present-day work-horse. However, cable communications is to the point of economic justification in many areas. Because cable can be buried along the right-of-way, it is immune to weather and electrical disturbances of high-voltage power lines. In congested metropolitan areas, cable communications might well be the answer—it does not use spectrum space which requires Federal Communications Commission licensing. Also, cable communications is now technically able to provide the circuit capacity of microwave.

In addition to hardware that can provide greater circuit capacity, improved microwave and cable systems, improved coding techniques and bandwidth compression make it possible to cram more circuits or communications paths into a given electrical space, often called spectrum.

Whether it be basic communications equipment or improved coding techniques, bandwidth compression, or whatever, one thing is clear: Technology will provide the railroads with all the communications facilities they will require, now and for the next 100 years.

This tremendous communications capability will enable the railroads to have true centralized control at their headquarters. Even now, railroads can have operations control centers, and some do. The extensive use of visual displays, plus on-line, real-time computing back-up for information processing and retrieval make such a control center possible. Train-

movement data could be supplied by automatic car identification scanners at strategic locations, plus readouts from centralized traffic control machines.

In addition to such control centers, some railroads will find it advantageous to have a top management "chart room" or visual display center. Here, in all forms of graphic displays (built into the walls) would be "the big picture" for top management. Equipment would include motion-picture projectors, closed-circuit TV screens and controls, videotape recording equipment, cathode ray tube displays, charts, graphs, various intercom devices, pushbutton telephones. Many of these devices would be connected to computers to provide instant information retrieval, to provide temporary viewing or with reproduction equipment to provide a printed copy of the information. Communications would also be provided to various field offices of the railroad to enable top management officers to speak directly with field managers. Provision would be made for talking, writing or drawing between the headquarters chart room and the offices out along the line.

IN CTC TERRITORY, THE BOSS WILL BE A COMPUTER

What computers often do best is handle routine or repetitive chores. One area receiving serious study today, and certainly one that will come to early fruition, is computer control of CTC operations. Simulation of train operation in centralized traffic control territory has already been accomplished. The simulation would provide a standard against which actual operations could be measured for quality control. Computers would take over routine monitoring of CTC operations, sending out controls to position switches and set signals to meet schedule requirements in line with actual running locations of trains. When unusual conditions arise or trains get off-schedule by a margin sufficient to require human intervention, then the dispatcher would take over.

Instant retrieval via printout or visual display techniques would provide status reports at any time concerning train movements. Exception reports could be generated when any train deviated from the standard by a predetermined amount. Thus the dispatcher could be alerted in time to take remedial action.

For further improvements in on-line train operations, railroads will tie in real-time computers with clearance and hotbox detectors. Data from clearance detectors, for example, would be telemetered to central locations and fed into computers which contain information on clearance restrictions. The computer would match the detector's reports against this filed information and issue instructions for routing the train around the restricted locations.

THERE'S ALMOST NOTHING THIS MACHINE CAN'T DO

Statistical studies can now be produced on computers to determine hotbox occurrences. Information from hotbox detectors can be fed into a computer, which would instantly analyze the data and compare it with reports from previous scans by detectors. Hotboxes could be flagged immediately, and journals just beginning to heat up could be flagged for attention at the proper time.

A third major area of computer usage in signaling is well adopted now—in control of automatic yards. Further refinements will be made in this next century. One effort that will probably be made by railroads will be that of complete automation of paperwork. The yard computer will prepare the switch list from advance consist information and ACI scanner reports. Routing of cars and positioning of switches and control of retarders will be computer-controlled. They are today, but for the next few years or so, developments will be along lines of developing faster, greater data-handling capacity and smaller-sized computers. These factors will enable roads to install them at flat yards as well as at retarder yards. Sensing devices are coming into use which will provide the necessary car-location data for computer control in flat yards.

Thus, complete computer control of yards and terminals will be expanded to include all yards. Some of the smallest yards will be but segments of a larger terminal-control system.

What has been described can be done. Much can be accomplished now. There will be refinements in technology and improvements that will come as the years pass. But the basic tools of the technological revolution are here, for providing quality control for managing railroads. **—Robert W. McKnight**

TOOLS OF REVOLUTION

IT'S MEN WHO MAKE REVOLUTIONS

Men built the Pacific Railroad—men armed with little more than blasting powder, picks, shovels and spike mauls. Men—the Irish, the German, Crocker's Chinese—created that first land-transportation revolution, a century ago.

Now, men will create a new, all-transportation revolution—and these men will be drawing on a well-stocked arsenal of weapons designed to prevent transport chaos and to provide transport capability undreamed of just a few years ago.

Railroads have come a long way, in the 100 years

since May 10, 1869. Other forms of transportation—motor carriers and airlines, especially—have also come a long way, and in a much shorter time-span. How far railroads can go in the next 100 years—and how well all transportation can be welded into a true service "industry"—will depend upon many factors. But no single factor will weigh more heavily than that of manpower quality.

In this context, there's much to be said for IBM's advertising slogan: "Machines should work. People should think." Today, in the front office and out in the field, there's a kind of man/machine competition—and the question of "who's master?" is sometimes in doubt. Railroads—all transportation, in fact—will move much more smoothly into the future when that competition gives way to a coordination of the work/think processes.

In any far-flung enterprise—and transportation is certainly that—this man/machine coordination will place extreme demands upon management quality and upon management's ability to motivate and to communicate its goals.

The machines are here, now. Between today's highly efficient communications systems and today's computer complexes, today's managers have the tools for timely and accurate decision-making. This is true in the front office, where the big decisions are made. It's also true, to an increasing extent, out in the field, where the minute-by-minute operating decisions must be made.

But one job remains to be done: Men must learn to be more comfortable in the presence of machines, if the machines—and the men—are ever to do the work they're capable of doing.

All of this takes on added importance, with a study of the demands which are likely to be placed upon transportation. Certain conclusions might be drawn: First, the projected growth of the economy will produce a steadily rising market not just for more transportation but for more efficient transportation; second, this demand for efficiency in distribution systems may be too much for any one mode to cope with; third, industry and government alike then may be forced to think in terms of integrated or multi-modal transportation; and fourth, the railroads' across-the-board transport capability should place them in a keystone position when total-transportation arches are built.

Super-transportation should be the result. But again, it can be only as "super" as the quality of its managers and operators permits.

What about the quality of transportation manage-

ment today? Generally, it is better than critics will admit. If there are failings, in a broad sense, they lie in lack of flexibility and narrowness of vision. And not all of these failings can be blamed on the current generation.

Certain types of management can be identified. In trucking and among the airlines, both relatively young businesses, there's still an element of founder-management. But the airlines, blessed with glamor and growth, have had a steady feed of new blood into the enterprise. Even in trucking—where legend revolves around the iron-fisted pioneer who built an empire from a one-truck start—top people talk proudly of their improving record in recruiting college-trained and business-oriented talent. Railroading presents a somewhat different picture—dictated by history. Railroading's managers are successor-managers—blessed with certain advantages created by their predecessors but also cursed with most of the disadvantages, the bad and the shortsighted decisions that a company or an industry can pile up in 100 years or more.

NEW GENERATION OF COLLEGE GRADUATES REDISCOVERS THE RAILROAD AS A CAREER.

Age itself has been a handicap in railroading. Any hundred-year-old industry has a problem in generating a positive, forward-looking image. Many railroad men looked apprehensively at the whole Golden Spike celebration buildup, for instance, out of concern that press and public would dwell only on the past—looking misty-eyed at the nostalgic and refusing to turn an eye to today and tomorrow.

Railroads have been cut, deeply and bloodily, by history. The industry's well-publicized labor problems, its difficulties with the passenger train, its chronic revenue/income/investment problems all have their roots in history.

One result has been that until recently railroads have had a tough time competing for talent on the open market. A rigid seniority system seemed to prevail, in management just as much as in unionized jobs. Young men knew, coming in, that it might be years before they could amass enough time-in-grade to move up into responsible—and better-paying—positions. Many of them simply elected not to come in. The airlines got them, or IBM, or the aerospace industry, or somebody else.

This is changing. There is more mobility within the industry. Case in point: One midwestern road, at last count, had nine officers of vice-president rank or better who came in from the outside. Movement like this was unheard-of just a few years ago. At the same time, better opportunities are opening up for young men straight off the campus—and more and more railroads are reporting better and better results from their campus-recruiting campaigns. For one reason or another, the current generation of graduates is rediscovering the railroad career. Perhaps, as one observer puts it, "the kids are a step ahead of us—in looking at a transportation system with the railroad at the center of it."

Unfortunately, this same brand of success is less noticeable where general railroad employment is concerned. With employment declining and with labor problems everywhere, working on the railroad doesn't hold the attraction it once held for the youngster straight out of high school—even if his father and grandfather before him were career railroad men.

One of the major rail labor organizations surveyed its membership a few years ago—and the results indicated the scope of the problem. Most employees regarded their own jobs as interesting. But most also regarded their chances of advancement as poor—and a great majority indicated they would not recommend a railroad career to a young man searching around for career opportunity.

If railroads are to have the future that's hoped for, this situation has to change. But it won't, most observers would probably agree, until the entire personnel structure—top to bottom—has the understanding of what has to be done, why it has to be done, and why it's important in the context of each individual's contribution.

This is where motivation and communication come in. This is where history has to be forgotten—with management and the labor organizations trying to make a fresh start.

TOP MANAGEMENT AND LABOR ARE FINDING THAT THEIR INTERESTS ARE THE SAME.

It would, perhaps, be far easier to abolish railroads and begin all over. Restrictions and inflexible rules built up over the years—like barnacles on a ship's hull—would be scraped off; manpower utilization could be geared to the here and now, not to the past.

This, however, isn't today's answer. As matters stand, railroads and the labor organizations must live with precedent–and only hope that it can be modified before it becomes an instrument for self-destruction.

Again by reason of age, the railroad industry has transportation's toughest labor problem. It has a morale problem. It must contend with a multiplicity of labor organizations, each struggling to survive as total employment has dropped. It has a more subtle problem in an apparent lack of understanding, on the part of union people, of what must be done to make changing times work to the benefit of the industry and its employees. It has, in short, both an anachronistic union structure and one not now capable of assessing the opportunities that tomorrow's transport demands will present.

Still, there are signs of progress in the rail labor movement. Consolidation of operating unions has reduced their number from five to two. The biggest of the non-operating organizations has had a degree of success in promoting merger.

Some representatives of management are skeptical, or fearful, of the results of this movement. There is a concern about concentration of power. At the same time, union consolidation makes a great deal of economic sense. It should result in an upgrading of union leadership, at all levels. It should produce organizations which are more capable of adjusting to change–organizations with a greater measure of stability.

Now, top management people and top union people are meeting, at more-or-less regular intervals, to try to reach agreement on matters of mutual interest. Hopefully, positive programs will come out of these meetings. But even under the best of top-level conditions, positive programs won't work unless those people who execute the programs–management and rank-and-file personnel alike–know not just what is being done but why it is being done.

Other forms of transportation don't lack for management-labor difficulties. The maritime industry is cursed with problems rivaling those of the railroads. The airlines have their own version of the railroads' locomotive-manning controversy, along with serious problems with maintenance personnel. Motor carriers don't find it easy to bargain with their drivers, even though the operators' union gets generally high marks for its desire to grow in strength by helping the industry to grow.

Still, railroads seem to have the toughest of problems–in trying to improve manpower utilization without always being able to show, in concrete terms, the benefits which will be realized.

This is one factor in the rail unions' lack of support for railroad expansion into other forms of transportation. And it's an ironic thing, in view of the lack of support found for these proposals in other quarters: Outsiders seem convinced that railroad desires for transport expansion are based on an intent to put all the traffic on rails and dry up non-rail traffic; rail union people fear that multi-modal expansion will lead to rail management's throwing the business elsewhere and further cutting down on rail operations and rail jobs.

A PROGRAM FOR MANAGING CHANGE–RATHER THAN BEING MANAGED BY IT.

There are, in short, several major goals which must be achieved if the railroad is to play the role envisioned for it. The list is not especially long–but it contains no unimportant targets:

–To an even greater extent, the educational community must be made aware of the opportunities that exist in railroad and transport management.

–Management itself must improve its ability to translate objectives, in meaningful terms, to all levels of supervision and, in fact, to all levels of employment.

–Common interests must be developed and pursued by industry's management and by the labor organizations' management, working together.

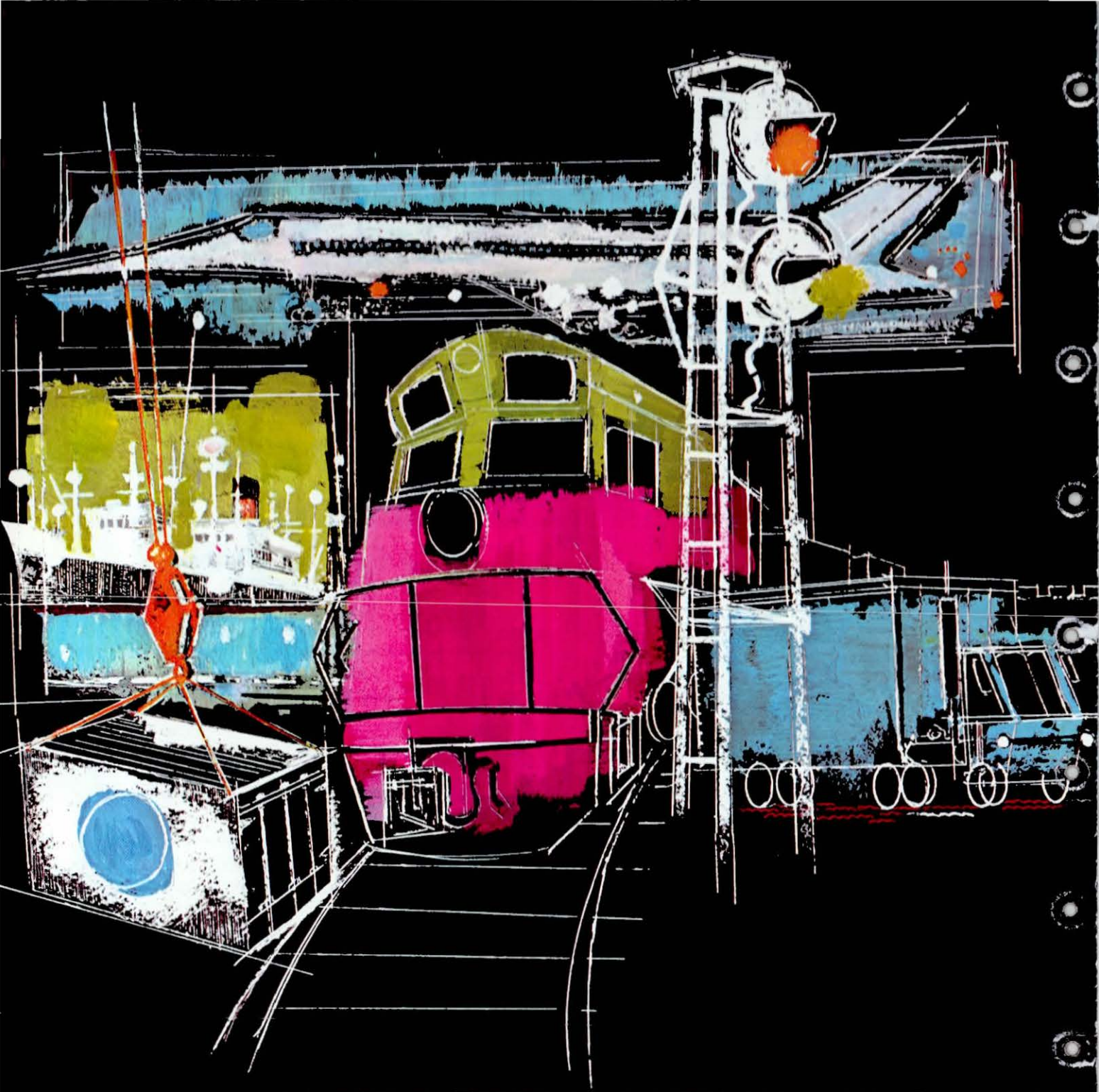
–Those men who plot the course for organized labor must recognize a need for change; they must have the capability for understanding change and they must be given, by management, both the surface and the underlying reasons for new proposals.

–New channels of communications must be opened up, top to bottom and bottom to top, in management and in labor and between the two.

–Realization must come, that the enterprise cannot succeed if the work force reacts negatively or even passively to proposals for improvement; and realization must come in the labor movement that both union and individual employee can win no long-range gains from an enterprise that isn't in good competitive and financial health.

Finally, there is this point to be made: In no business today is progress a unilateral thing. Management has its responsibilities, organized labor has its. But the big responsibility–that of ensuring success –rests upon both.

–Gus Welty



NEXT STEP: MULTI-MODAL TRANSPORTATION

When John A. Volpe became Secretary of Transportation early this year, he discovered that separate research and testing facilities were being planned by the Federal Highway Administration and the Federal Railroad Administration. He sensibly decided to combine the two on a single site, in the interests of efficiency and economy.

This is one sign that multi-modalism is beginning to permeate official Washington thinking. A more important one was the creation of the Department of Transportation itself, bringing together, under a single Federal roof, the railway and highway and airway policy-makers.

The next logical step, in the view of transportation economists, is the bringing together of the various modes under a single corporate roof—the creation of multi-modal transportation companies.

To these economists, it is significant that the only privately-owned railway system outside of the U.S. —the Canadian Pacific—is part of a company which also operates trucking, air and steamship lines. The operative phrase is "part of a company." The Canadian Pacific Railway doesn't own an airline; Canadian Pacific Air doesn't own a steamship line. They are all owned by a transportation company.

In the U.S. today, the creation of such a company is prohibited by laws and interpretations of laws that go back to flivver days—and reflect flivver-era thinking. There are growing pressures to change all this. A bill will soon be introduced in Congress to permit the creation of integrated transportation companies. The rewards could be great—for the carriers, who will find strength through unity; for the shipper, who will find single-carrier responsibility for whatever service or combination of services is to his advantage; for the consumer, who will find the efficiency and economy of one-package transportation reflected in the price of everything he buys.

Intermodal transportation is not new. Its advantages have already been demonstrated.

A limited example is found in piggybacking, which combines low-cost, long-haul rail service with the flexibility of trucks at each end of the line. In only 13 years, piggybacking has grown from 168,150 carloads a year to more than 1.3 million. Due for implementation this year is the land-bridge concept: Cargo flowing between Europe and the Orient will move by rail across the continental U.S., avoiding the costly, time-consuming passage through the Panama Canal.

But these examples of intermodalism are limited—limited by the fact that the modes that provide them are still separately owned.

This limitation derives from the very nature of the businessman, which is to sell his own product—not that of his competitor. It is the nature of a railroad or a trucking line or an airline to go for the long-haul.

Common ownership would remedy this. The transportation man—with a stake in all modes—would logically sell that service or combination of services that would be (1) most efficient and economical, and would therefore (2) bring the customer back for more of the same.

Opponents of common ownership protest that it would stifle competition. But advocates of this concept envision not one but a number of competitive multi-modal companies. And these companies would not necessarily be called the Penn Central or the Santa Fe; they could just as well be called Consolidated Freightways or United or Trans-World.

Still other opponents make the point, which has some validity, that intermodalism is in any case limited, insofar as it suggests the actual transfer of freight or people between modes.

Perhaps multi-modalism is the better term—suggesting, as it does, the concentration of the resources and inherent capabilities of several modes upon a single goal: efficient transportation.

To cite just one example of how this pooling of resources might work: (1) Railroads have enormous holdings of linear real estate; (2) airlines have enormous problems of finding enough space for their supersonic terminals. (Airline men are already expressing the fear that in the absence of adequate terminal facilities, the jumbo jet freighters will not be the white hope of tomorrow but the white elephant.) Why not build jet runways over existing railroads—and share existing terminal facilities?

The possibilities are almost endless; unfortunately, in an era of separatism and fragmentation, they are also almost unexplored.

There is, of course, an alternative to the creation of privately owned transportation companies. That is the creation of a single government-owned transportation company, the route most of the rest of the world has taken. Railroads prefer the private-enterprise route.

A century after the Golden Spike, railroads are ready to play their part in the second transportation revolution. They will do so from a position of strength: Rails this year will haul more goods for more money than ever before in history.

Are the other modes ready—while they can also act from strength?

—Luther S. Miller

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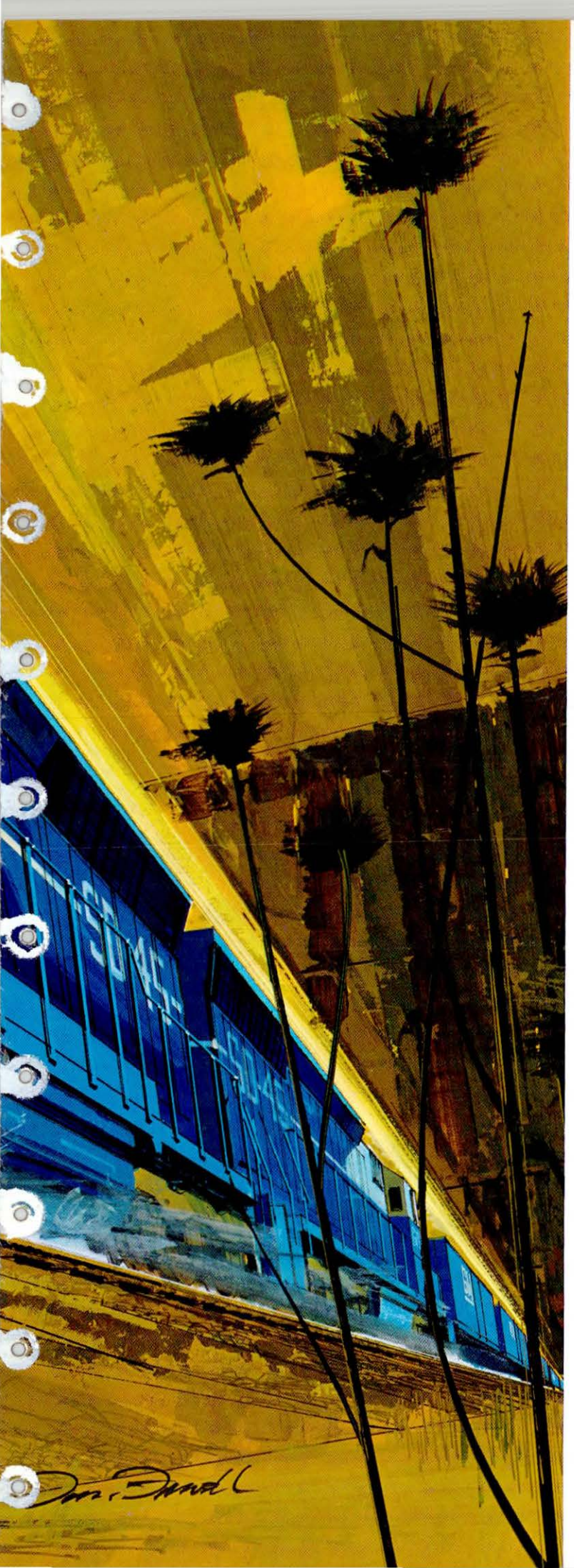

Iron Horse, 1969

In May of 1869, a golden spike was driven into a rail tie at Promontory Point, Utah, and the pounding was heard from coast to coast as telegraph keys signaled that the Atlantic and Pacific oceans had at last been joined by rail.

This was indeed the year of the Iron Horse. The horse that puffed, smoked, and chugged across the nation's first transcontinental railway.

The significance of this event in railroad progress was matched by the birth of a new Iron Horse just 30 years ago. The nation's first Diesel freight locomotive.

This General Motors locomotive—the one that proved that this new kind of motive power could do twice the work of steam at half the cost—started an avalanche of savings, new efficiencies and conveniences for railroad operation. These benefits have been expanded and multiplied in today's second generation of Diesel motive power.

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Our Iron Horse is a thoroughbred all the way. She runs at the head end of railroading's newest advances in containerization, piggy-backing and jumbo rolling stock. She can be programmed, automated and radio controlled.

America's railroads can bet on our Iron Horse today and in the years ahead. All she needs is a fast track and a green light.

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Electro-Motive Division
La Grange, Illinois

An early McC&T advertisement which was published 90 years ago in the First Edition of the Car-Builder's Dictionary, now known as the Car and Locomotive Cyclopedia.

When the above advertisement appeared in 1879... we were already 10 years old

McConway & Torley's roots go back to the historic year of the driving of the Golden Spike. After 100 years of service to the railroad industry, we are looking forward to the opportunities that many more tomorrows hold.

The name "McConway & Torley" has become a synonym for quality couplers. You may be sure that every modern facility for the improved performance of these McC&T products will be thoroughly explored in the busy railway era ahead.

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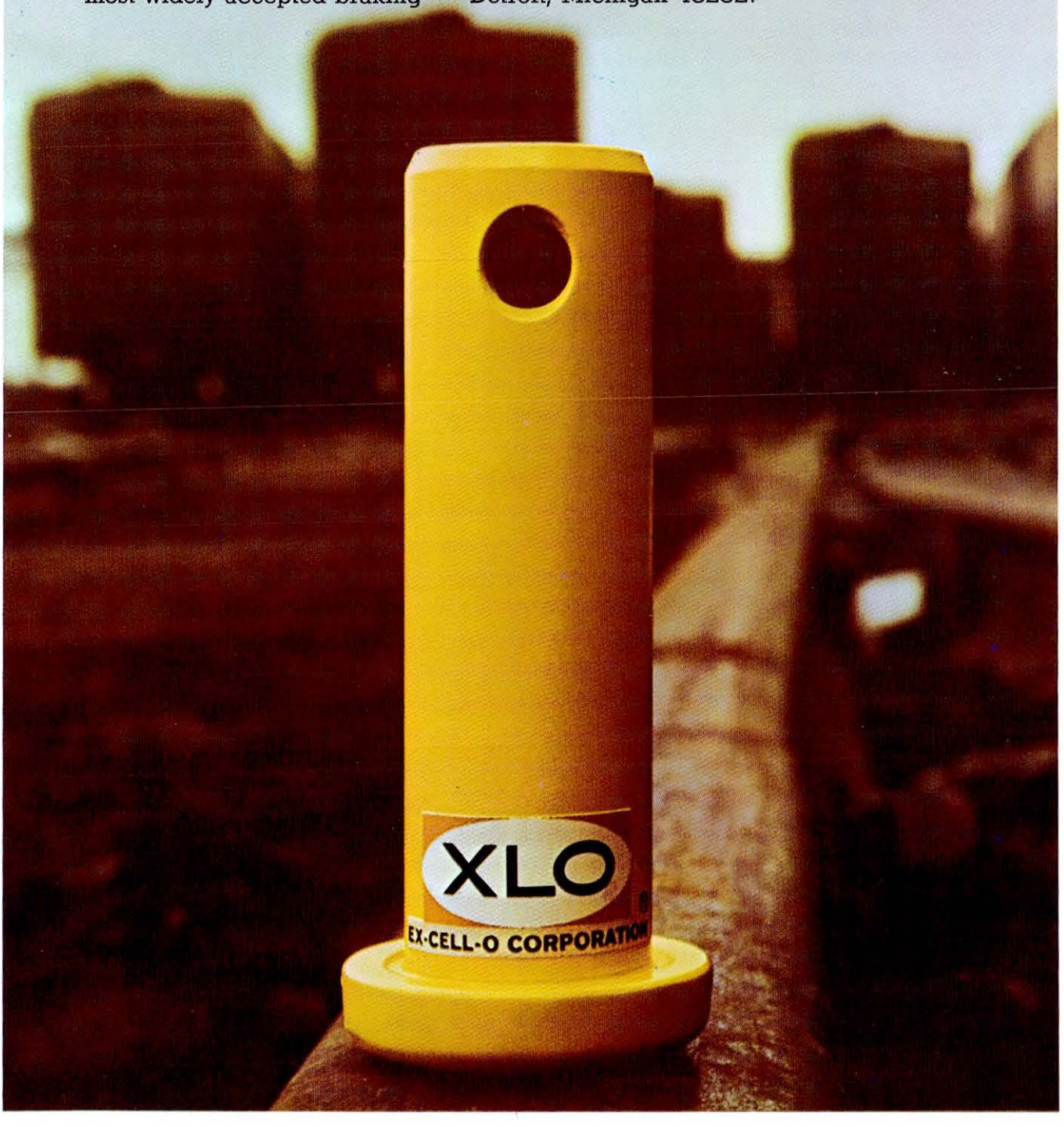
Ask WABCO about Ex-Cell-O's track record.

Westinghouse Air Brake Division demands a lot of itself. And consequently delivers a lot to its customers. Brakes that stop today's high-speed, high-mileage freight cars faster and more economically.

As a result, the WABCOPAC brake assembly is one of the most widely accepted braking systems in the industry.

One of the ways WABCO stays on top is with Ex-Cell-O F Series Pins—the toughest you can buy. Pins that roll hundreds of thousands of proven maintenance-free miles.

Like to hear more? Write Railway Products, Ex-Cell-O Corporation, Box 386, Detroit, Michigan 48232.



How can steels that aren't used in this locomotive make it more efficient?

The efficiency story is in the cars behind it. They use USS COR-TEN High-Strength Low-Alloy Steel—up to 40% stronger than carbon steel—which permits construction with thinner, lighter plates to increase payload by several tons per car. Or, by using the same gages as with carbon steel, you can provide greatly increased strength, durability and service life with the same payload. These are the reasons why this special steel has been used in more than 400,000 freight cars.

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to efficient performance. USS TRI-TEN Steel has high strength and toughness, good fatigue resistance, and good welding and fabrication characteristics—all at relatively low cost. USS EX-TEN Steel is the biggest bargain of all in carbuilding material. Its strength-to-cost ratio allows designers to trim both weight and cost through the use of thinner sections.

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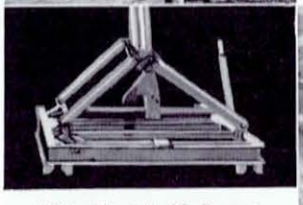
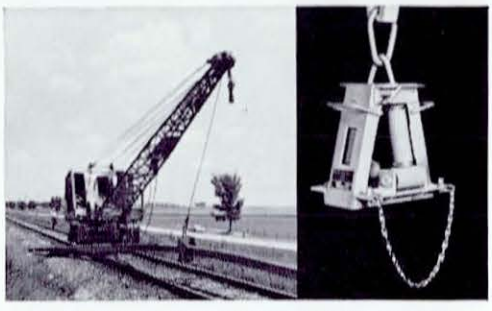
BURRO
TIME SAVERS!

New Burro Multiple Rail Lifter handles up to 8 rails and more per lift.

Model 40 Burro, equipped with automatic folding leads, shown driving piles with a diesel pile hammer.



This Model 40 Burro Crane using a Burro Panel Track Lifter picked up and loaded 106 completely assembled, 39' panel sections in less than 200 minutes.



Burro Rail Threader provides fast, efficient handling of continuous welded rail.

Model 40 Burro Ditcher supplies its own locomotive travel and work power. Ditcher loads the dump cars and furnishes necessary air for dumping.

Rugged and versatile, Burro Cranes and Equipment get the job done fast and efficiently, on the line, in the yards or Stores Department. Burro takes any job in stride. Pile driving, ditching, handling welded rail, multiple rail or panel track lifts is done quickly and economically. Pound for pound, there's more work power and versatility built into BURRO Cranes than any other unit.

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The Railroad, The Sioux, and the Repeating Rifle.

The work gangs started west from Omaha, laying 5 miles of track a day.

They had to go through the Cheyenne Pass and they had to go through the Laramie Hills.

And they had to go through the Sioux.

The Sioux had already massacred Fetterman and 81 men outside Fort Phil Kearny.

(Seven years later, they would massacre Custer.)

Now it was the railroad's turn.

The raids were swift and lethal. A brave could put 25 arrows into flight almost as fast as a man could pull a trigger.

The work gangs were good for one shot. After the first volley, they had empty guns. Trains burned and telegraph wires came down and railroad men died by the hundreds.

Two things kept the railroad moving: the Indians did not know how to rip up track—and the Winchester arrived.

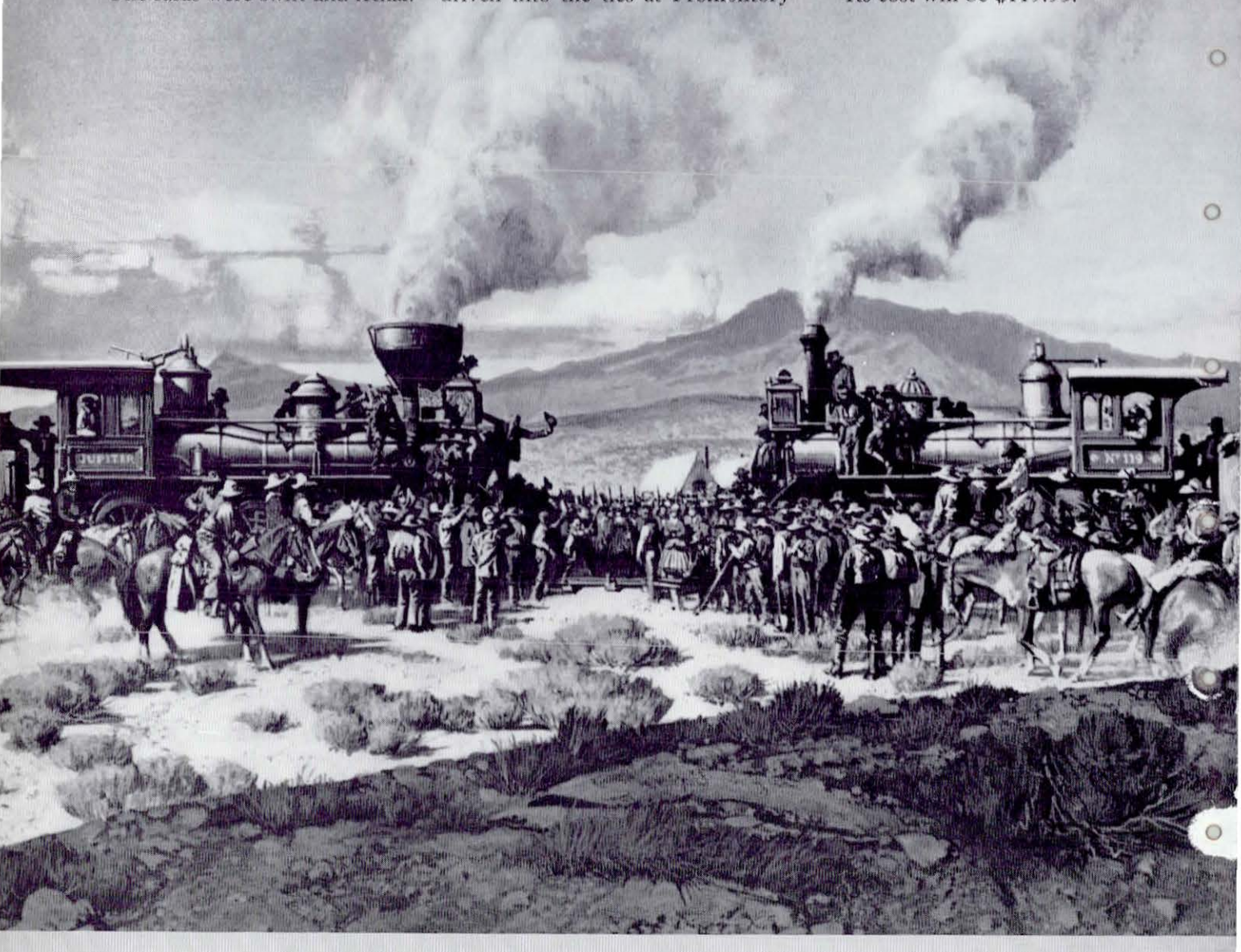
15 shots per man.

100 years ago the golden spike was driven into the ties at Promontory Point, Utah, where the Union Pacific and the Central Pacific met.

We feel it would be appropriate to mark the anniversary with a special, limited edition Winchester—the Golden Spike Commemorative.

With a receiver and barrel bands of plated yellow gold, a commemorative scroll on the breech, and a U.S. Mint-struck medallion in the stock, this beautiful version of our famous "94" will be offered in carbine only.

Its cost will be $119.95.



WINCHESTER

We won't sell a gun we haven't fired ourselves

For people who missed it the first time, KarTrak helps do it again.

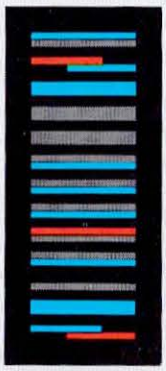
In 1869, it was the old silver-maul/golden-spike routine. The last tap closed a telegraph circuit to tell the world about the event.

Today, it's only an act.

Because this time, the real signal about the Promontory Summit meeting comes from railroading's newest technology, the KarTrak* ACI system.

We put KarTrak labels on each of the engines. And set up a trackside scanner to generate the signal that sends the news around the world.

It's more than just a gimmick, though. We're helping tell a powerful story.



By the end of the year, the entire freight car fleet will wear KarTrak labels. But they won't do you much good unless you have the complete KarTrak ACI system to keep track of the cars.

It's going to make your second century coast to coast a whole lot easier.

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making tracks for the future

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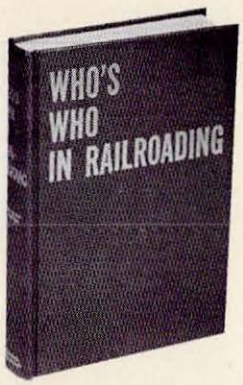
Know your man!

How pleased you are when somebody knows who you are, where you've been, what you're doing! How pleased other people are when you know something about *them!*

You'll find the new 1968 edition of "Who's Who in Railroading" a gold mine of information about many a man important to you:



- His present title or position
- His business address and home address
- His age, marital status, family
- His career—including railroad, professional, military
- His technical society memberships, public offices held, books and articles written
- His education, clubs, fraternity

"Who's Who in Railroading" contains 6,000 entries—of which 1,500 are new in this new 16th edition. They include railroad executives, leaders in the railroad equipment and supply industries, railroad labor leaders, members of regulatory bodies, ICC personnel, transportation economists, specialists in railroad finance.

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Boston chose RAMCO—just as Chicago did—with an eye on initial economy and future maintenance savings of up to 50% a year per track mile. Both of these cost savers accrue from RAMCO's unique track system: *continuous welded rail secured to exclusive RS concrete crossties by elastic steel spring fasteners.*

And, just as in Chicago, commuters between Boston and Quincy are in for the ride of their lives. The "whisper smooth" RAMCO ride along miles of track with no clickety-clack. The fast, quiet ride that will mark rapid transit systems of the future. Hats off to Boston. A city that's building its future right now.

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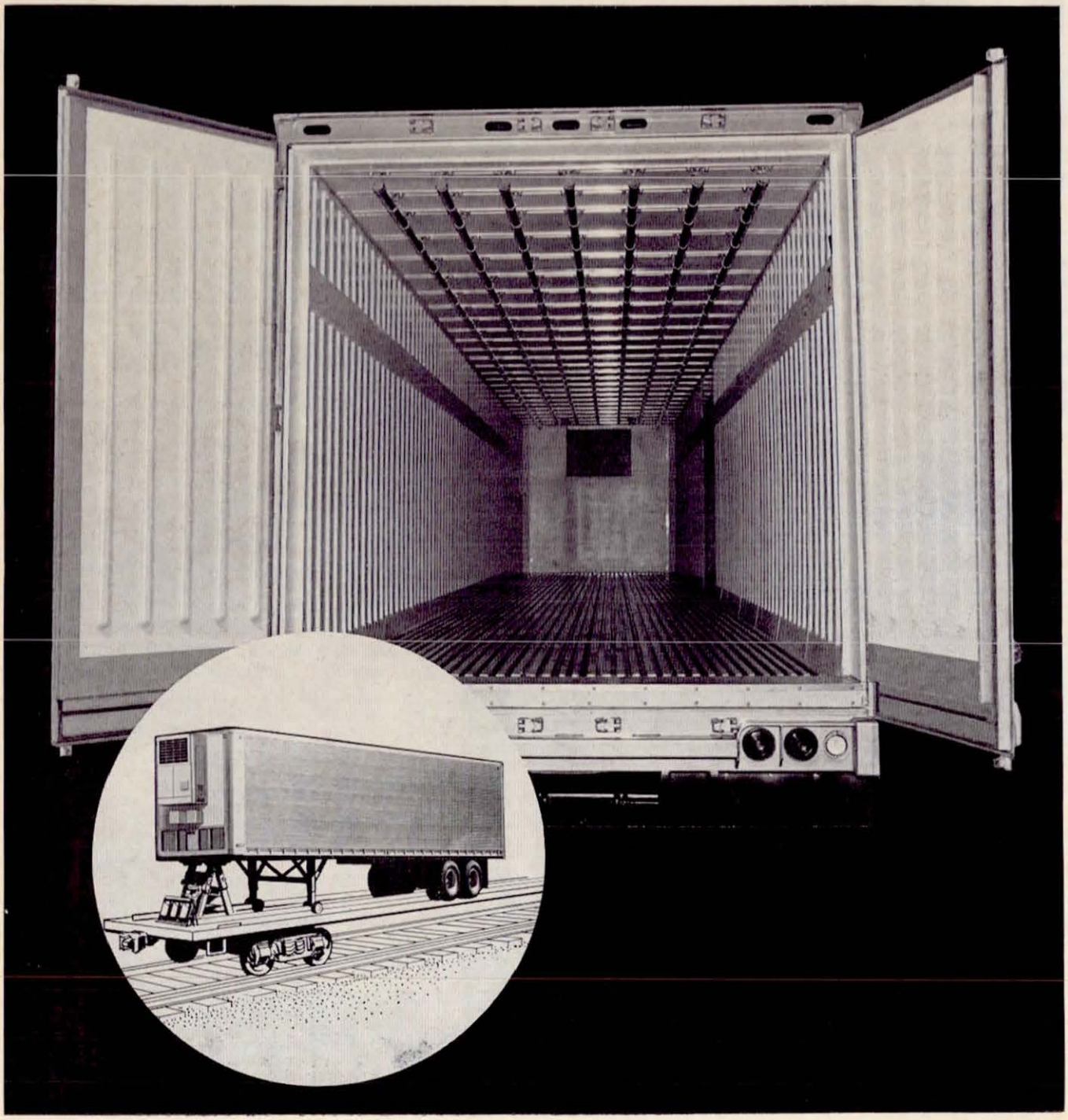

TTC PROGRESS REPORT:

Union Pacific's new North Platte classification yard delivers instant benefits: more throughput, less paperwork, better control, happier customers.

The best thing about Total Terminal Control is that the benefits, to both the railroad and its customers, are immediate. Union Pacific's new Bailey Yard at North Platte, Nebraska, is a shining example. The first benefit was the elimination of yard congestion along the line. "Congestion will develop at times," said a U. P. official, "Bailey Yard sure helps relieve that problem."

Seven other switching yards nearby also discovered an effective decongestant in the new North Platte two-way funnel. There are separate eastbound and westbound facilities. The eastbound yard (Bailey Yard) is the new one, and can handle more than 3000 cars a day. Two tracks over the hump lead to 62 tracks in the bowl. Twin hump towers and controls enable two trains to be classified simultaneously, or a single train can be classified from either lead to any bowl track via crossovers. The system provides a complete and instant inventory of every car in the yard. Combined with the companion yard that is now hustling westbound traffic, the new yard results in better control of all car movements, loads and empties, and marked improvement in the handling of both local traffic and long-haul, interline traffic. A process-control computer and a WABCO yard control system maximize Bailey Yard's huge throughput at the lowest possible total cost.

WABCO Total Terminal Control "building blocks" can be installed to make *any* class yard hum: • **Automatic Car Control** • **Automatic Yard Inventory** • **ACI Verification of Inventory** • **Hump Locomotive Speed Control** • **Dual Central Processors Linked with Data Processing Computers.**

You can apply a WABCO Basic Terminal Control System to an old yard and gradually plug in additional TTC "building blocks," or you can go all the way with TTC in new terminal planning. In either case, the WABCO TTC concept provides an instant increase in capacity without a proportional increase in capital for plant expansion. TTC increases throughput, decreases paperwork and human error, helps maximize car earnings, and keeps shippers happy. You owe it to your road to get all the facts about TTC. Call one of our sales engineers, or write WABCO Signal & Communications Division, Pittsburgh, Pa. 15218.

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This modern version of the "Wellman designed" diesel electric locomotive crane is the product of more than 50 years of accumulated experience . . . in the design, engineering and building of superior heavy-duty hoisting equipment.

Earlier models of this successful crane have been in continuous field service since 1956.

Early in 1960 the marketing and manufacturing of these high performance cranes was taken over by Ohio Locomotive Crane Company, who maintain complete engineering, fabrication, assembly and service facilities.

25 to 80 Ton Capacity
Speeds to 15 MPH

The
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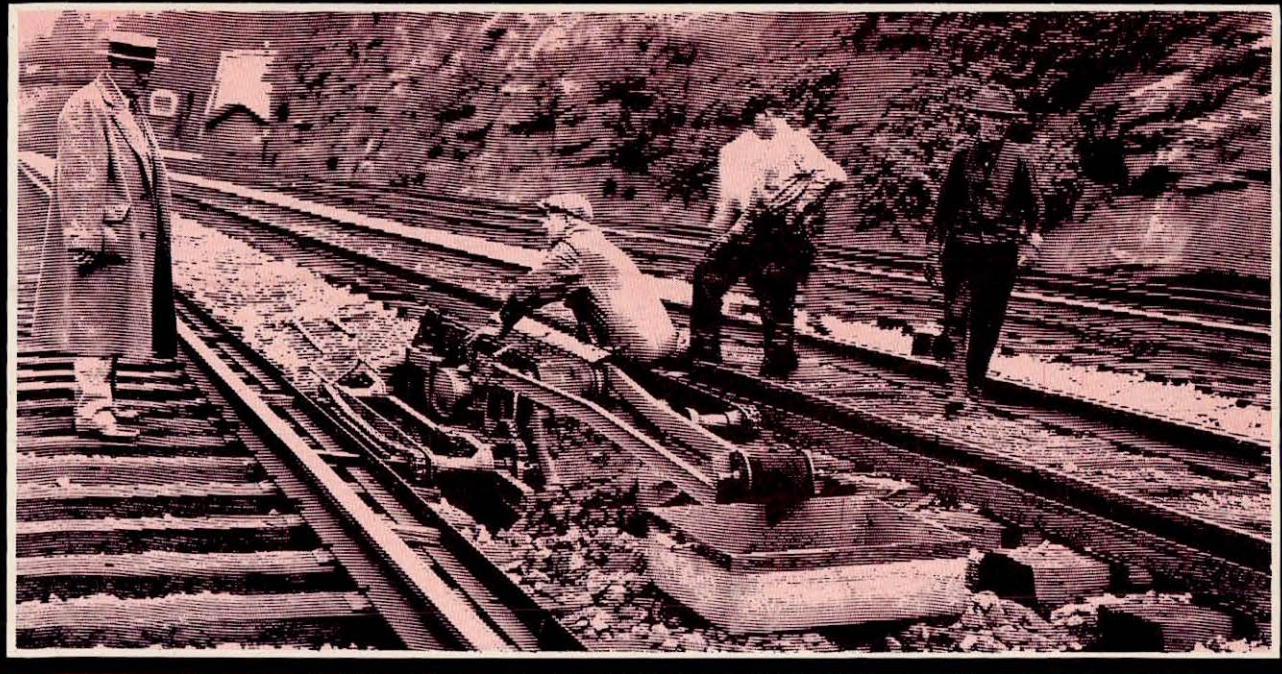
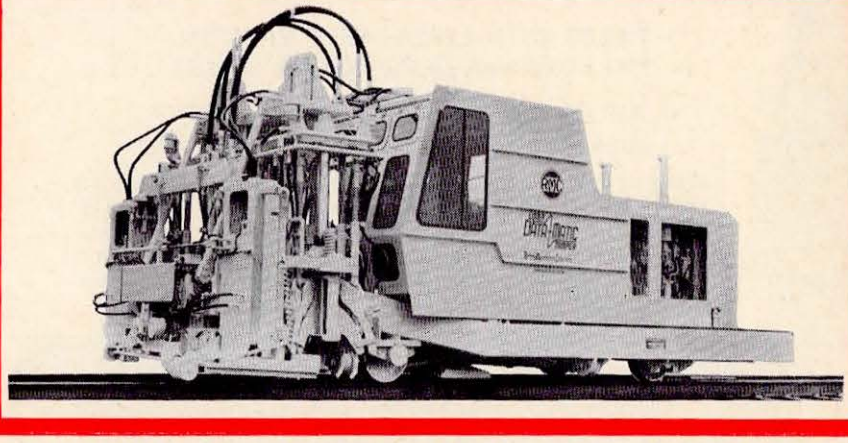
REMEMBER WHEN DATAMATIC WAS JUST A MOLE IN THE GROUND?



Today the Data-Matic Tamper-Liner is the world's most sophisticated track maintenance machine. It is a direct descendant of the first mechanized track maintenance unit—the famous McWilliams Ballast Cleaning Mole, introduced in 1925 by Railway Maintenance Corporation. □ Today, the highly-sophisticated Data-Matic is saving impressive sums in maintenance costs, while producing much better tamped and lined track. □ Better quality track at less cost—true of Data-Matic and the 40 other machines produced today by RMC—this concept had its beginning with the Mole.

1869 1969
GOLDEN SPIKE
CENTENNIAL



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RAILWAY MAINTENANCE CORPORATION

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Machines also built in West Germany, Australia and Canada.

Circle 33 on coupon page 109

ICC polishes its passenger plan

Although the Interstate Commerce Commission already has four legislative proposals deposited with Senate and House commerce committees, the proposal that could have the greatest impact on the rail industry is still being dressed for its trip to Capitol Hill.

That proposal would cover the Commission's jurisdiction over rail passenger service. It would mark the end of ICC deliberation over the question of how far the Commission can step into passenger operations and prescribe and enforce standards for trains judged necessary in the public interest.

The precise wording of whatever authority ICC might seek in this matter won't be known until the proposal is made. In addition to standards-setting power, it may include a change in the ICC method of handling discontinuances, especially where the last train between two interstate points is at stake.

What drafters of the proposal are waiting for is the conclusion of another ICC effort, a study of the real costs to the rail industry of providing passenger service as it exists now. The Commission announced this study early in October 1968, and said results could be expected in six months. That would mean any time, now.

In the study, ICC is looking for what it calls the real avoidable costs of passenger service — how much money could railroads save by dropping passenger operations. Looking for a genuine haystacked needle, ICC is trying to determine the unknown portion of common (freight and passenger) costs that really belong to passenger operations. Specific passenger costs in many cases are easy to find, and so are specific freight costs. But it's the grey area of the costs related to both that ICC set out to probe. Such a determination, has a bearing on what railroads can be ordered to do in improving passenger service.

When this proposal is ready, it will follow the Capitol Hill route of the other proposed bills. That is, up to the Senate Commerce Committee and into its surface transportation subcommittee for consideration, and up to the House Interstate and Foreign Commerce Committee and into its transportation and aeronautics subcommittee.

Of the ICC proposals that already have followed that process for the 91st Congress, one that has significance for the rail industry would give the Commission authority to require the establishment of through routes and joint rates between motor carriers—and carriers of any other mode as determined by ICC for the public interest.

This will make the fourth successive year in which ICC has gone after the through-route authority.

New this year is a request for authority to set temporary through routes between air carriers and between air and other carriers.

Another proposal that would have meaning for rail interests is one concerning judicial review of Commission orders. The proposal would shift the jurisdiction for judicial review of what ICC has ordered from special three-judge federal district courts to United States appeal courts. That would make ICC decisions reviewable in the same general manner as decisions of other major federal regulatory agencies. The Supreme Court would continue to have ultimate review. For cases involving money payments, review would still come under a single-judge district court. ■

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* October, 1968 "Railway Track and Structures"
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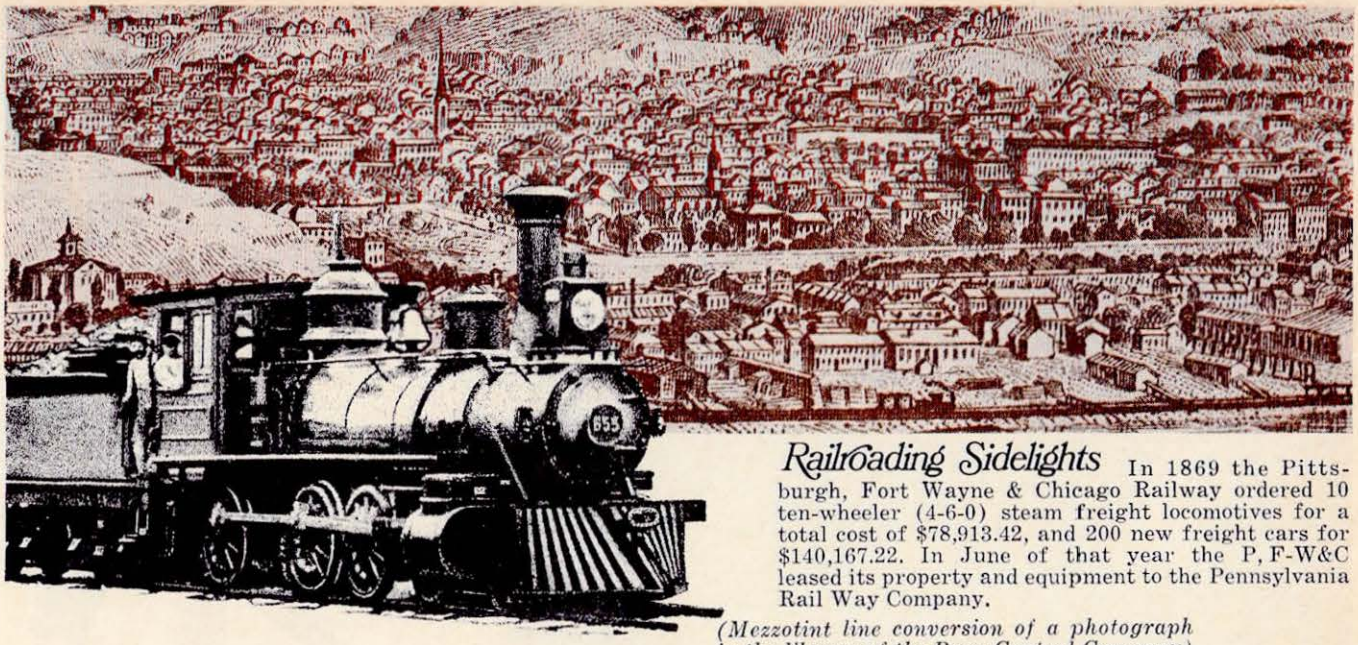


Railroading Sidelights In 1869 the Pittsburgh, Fort Wayne & Chicago Railway ordered 10 ten-wheeler (4-6-0) steam freight locomotives for a total cost of $78,913.42, and 200 new freight cars for $140,167.22. In June of that year the P, F-W&C leased its property and equipment to the Pennsylvania Rail Way Company.

(Mezzotint line conversion of a photograph in the library of the Penn Central Company)

Skills in Transition...

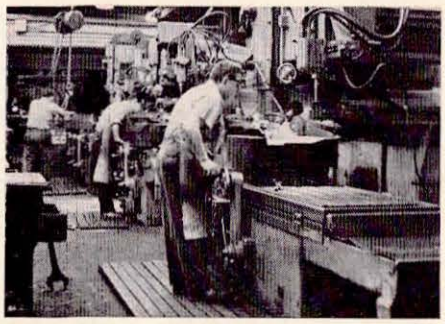
How No. 655 blew the whistle on our young Mr. Harris

Young Bill Harris had a lot to think about when he opened his blacksmith shop in the early 1870's. Each blow of his hammer was echoed by the pounding from the nearby P,F-W&C yards in old Allegheny City. The continent had been spanned by rail just a few years before; and every week No. 655 steamed out, pulling freight cars loaded with equipment and supplies to help build the new, law-abiding West.

Bill heard the signal. He shod fewer horses and shaped more parts for the railroading and mining industries. In time the firm of Wm. J. Harris & Son became the corporate forerunner of Pittsburgh Forgings Company.

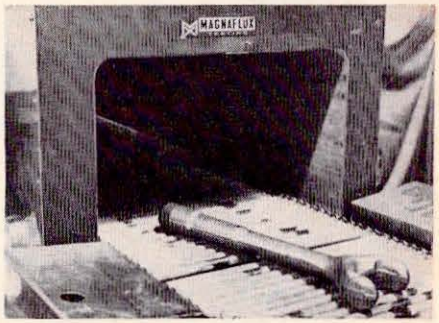
Perhaps Mr. Harris would not recognize his company today; but we know that he'd like it. Our plants are equipped with the latest machinery and methods, our annual volume exceeds $75 million, our stock is listed on the New York Stock Exchange.

But more than all this, *we still listen for the whistle.*



DIE-SINKING, performed in our own internal department, covers the entire range of our forging capacity.

FORGING facilities include drop, press and upset equipment, with provisions for heat treating, machining and assembly.



QUALITY CONTROL includes facilities for materials and product inspection to conform to any specified requirements.

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P.O. BOX 307, CORAOPOLIS, PA. 15108 • TELEPHONE 412: 264-4000

IMPRESSION DIE FORGINGS & FABRICATED ASSEMBLIES FOR THE RAILROAD INDUSTRIES

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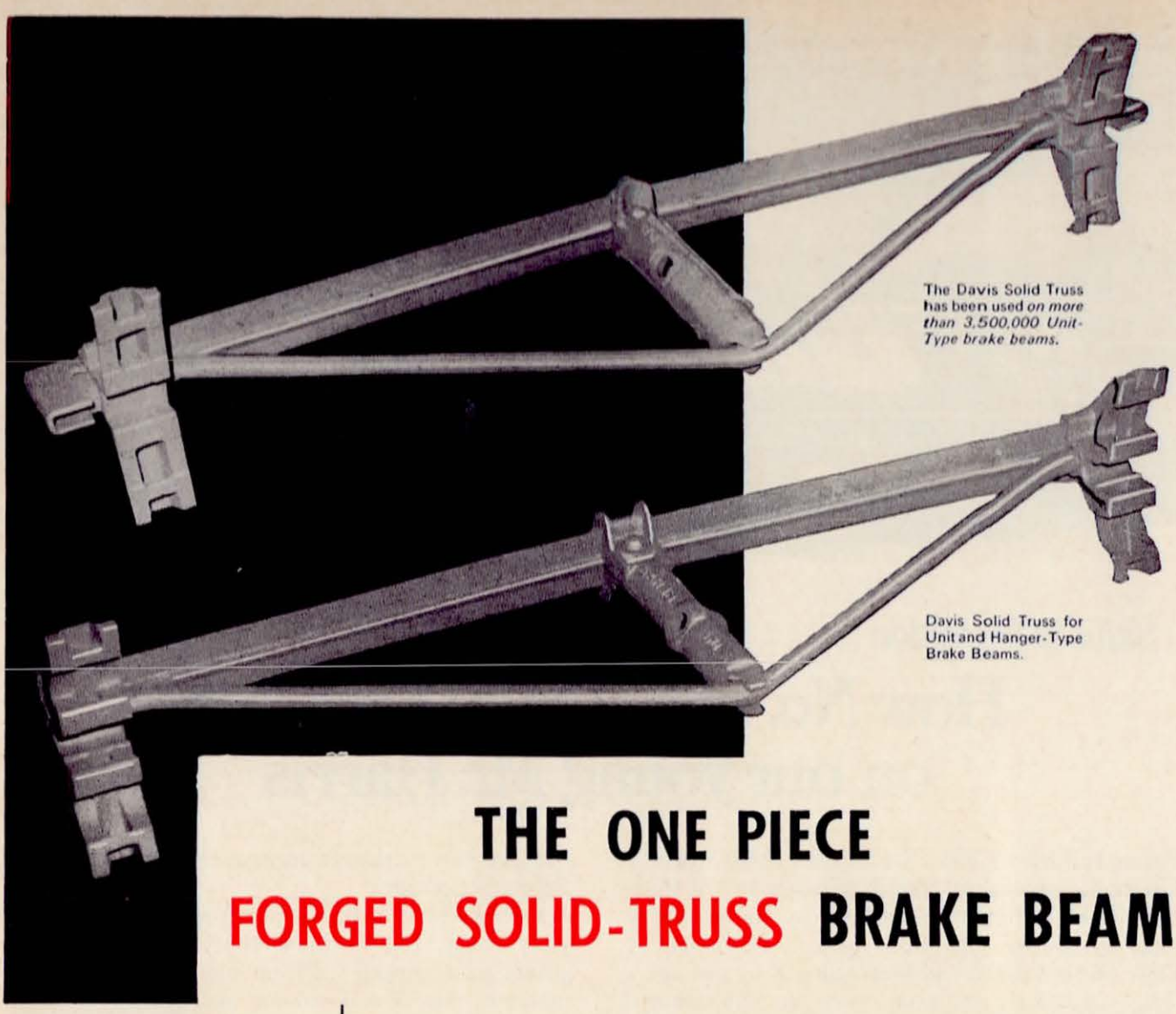
Circle 35 on coupon page 109



The Davis Solid Truss has been used *on more than 3,500,000 Unit-Type brake beams.*

Davis Solid Truss for Unit and Hanger-Type Brake Beams.

THE ONE PIECE FORGED SOLID-TRUSS BRAKE BEAM

Solid Forged Truss correctly distributes pressure from brake heads.

Still The Most Economical

Forged in one piece, the Davis Solid Truss eliminates need for two piece riveted, welded or bolted compression and tension members. Always rigid, strong and safe. A recognized standard for more than 50 years. ■ Certified are brake beams for 28,000, 24,000 and 18,000 lbs. capacity—all A.A.R. approved. Any part is renewable without disturbing the truss on hanger-type brake beams, and brake heads are interchangeable right and left. ■ *Davis Brake Beam Company, Johnstown, Pa.* Represented in: Boston, Chicago, Cleveland, Omaha, Richmond, St. Louis and San Francisco.

MEMBER RPI RAILWAY PROGRESS INSTITUTE

DAVIS SOLID-TRUSS BRAKE BEAMS

Circle 36 on coupon page 109

When you're connecting voice, data, or other signals to microwave radio, the right multiplex makes all the difference between a perfect and an imperfect union.

That's true for short-haul or long-haul, low-density or high-density applications. And that's why we offer the broadest multiplex line of any manufacturer.

In fact, we're the only manufacturer that makes multiplex equipment for every application.

Take our unique 46A, for example. You can buy one channel or 1260 channels. Or anything in between. The 46A maintains toll-quality performance on systems thousands of miles long. And you can assign data circuits indiscriminately without sacrificing voice service on any other channel.

Then there's the 24-channel 34A for light routes. And the AN/UCC-4(V) for military systems of 12 to 600 fully loaded voice or data channels.

And the 47A Radio Multiplex to transfer up to 144 channels from cable to radio and back again. Directly. So there's no need for back-to-back channelizing equipment.

In fact, we make just about everything you need for a complete communications system. Multiplex, microwave, cable carrier, data modems, and accessories.

If you want us to, we'll also install and check out the system, train your personnel, and provide back-up support for the life of the equipment.

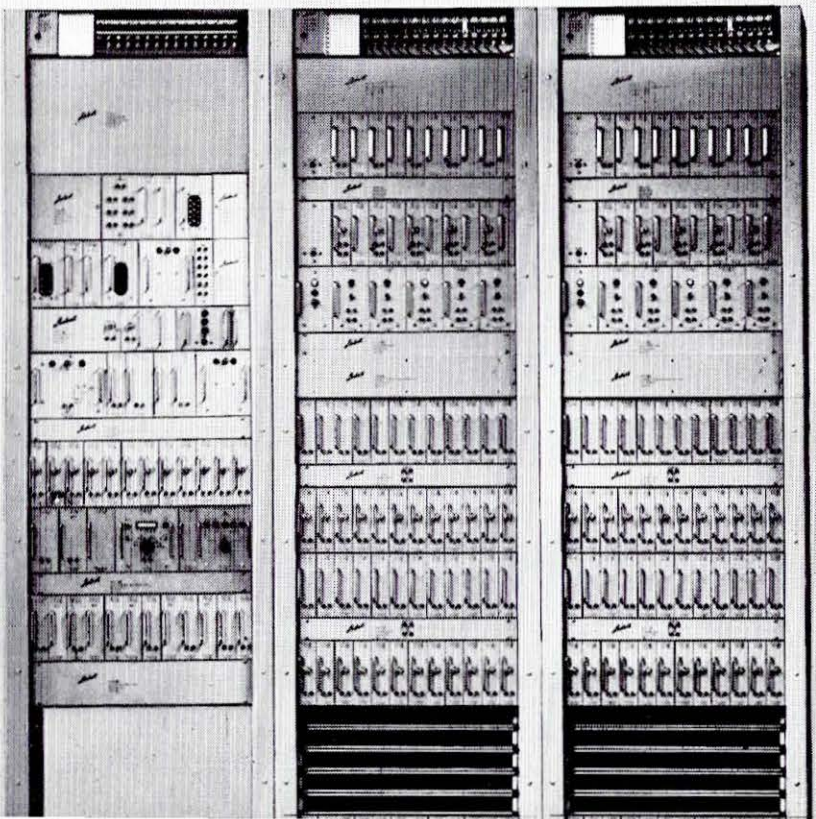
That completes the perfect union.

LENKURT ELECTRIC
GENERAL TELEPHONE & ELECTRONICS

Lenkurt Electric Co., Inc., San Carlos, California.

Multiplex Equipment from Lenkurt

In order to form a more perfect union.



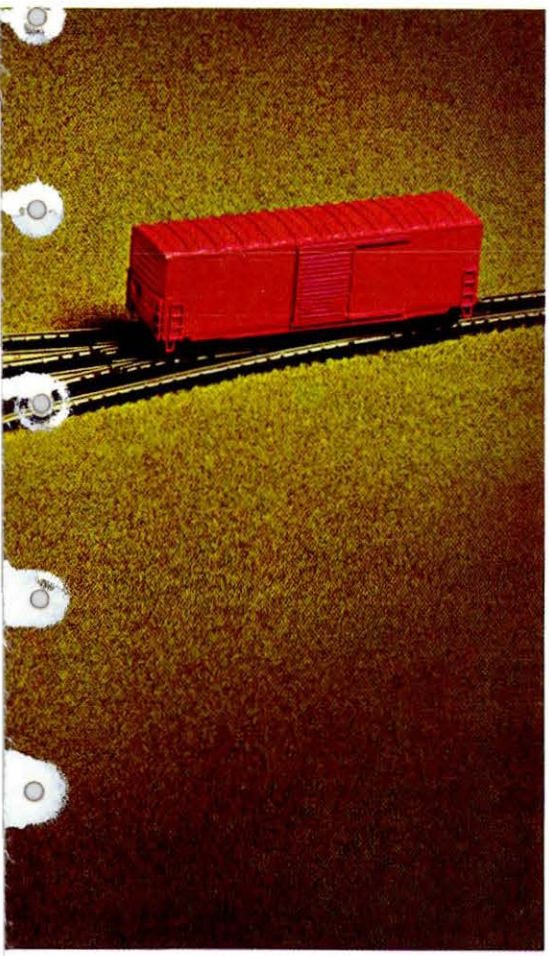
Illustrated above in blue: Pullman-Standard Foam Insulated Car; purple: PS 86′ Hy-Cube; orange: PS 60′ Auto Parts Car; green: PS Mini-Hycube; yellow: PS Waffle-Side Box Car.

RPI
RAILWAY PROGRESS INSTITUTE

You can't do much to a box car.

Except lengthen it, raise it, insulate it, cushion it, or give it waffle sides.

What you do to a box car determines what a box car can do.



Above: PS-1 40′ Box Car.

Since building the first standard box car, we've become the best choice for specialized box cars. Like Hy-Cubes, Mini-Hycubes, auto parts cars, foam-insulated box cars and cars with long travel cushioning.

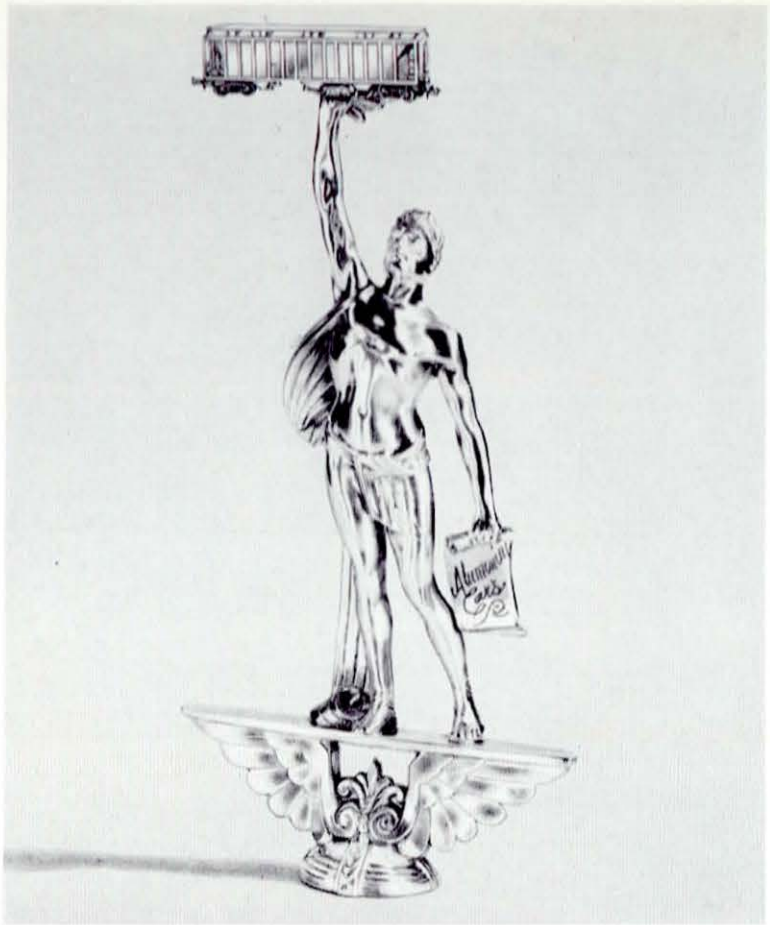
And now we've got a model with "waffle" sides.

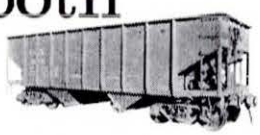
Single sheath car sides can be embossed with a "waffle" pattern, so that cross bar belt rails are recessed. This results in flush interiors, designed to protect lading from snagging and damage, while providing utmost efficiency in securing it.

When it comes to doing things with box cars, Pullman-Standard still does them best.

Pullman-Standard
WORLD'S LARGEST RAIL CAR MAKER
200 South Michigan Avenue, Chicago, Illinois 60604

A Division of **Pullman Incorporated**



The trouble with being famous for Aluminum cars...is that some people forget that we've been building steel cars for over fifty years... Great steel cars too, both standard and custom  in a wide variety of sizes, and capacities . It will be to your advantage to remember Magor next time you are in the market for steel cars. RPI

MAGOR

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Circle 39 on coupon page 109

UNIPAR: The magic word at Union Tank

COMPUTERS, here an IBM 360/30, help Union Tank keep track of its 50,000-car fleet.

The firm's integrated management information system is to be completed by the end of 1969.

Union Tank Car is aiming for late-1969 completion of an integrated management information system—dubbed UNIPAR, for Union Information Processing and Retrieval.

A tank-car fleet management system, first element in the three-phase program, is already operating. By mid-1969, computer technology will be applied to improvement of car-manufacturing processes. And by late this year, Union will wind up the program with start-up of electronic processing of accounting, personnel and marketing data.

Phase 1, the fleet management system, is not unlike those systems set up by most major railroads for car-location purposes. It's designed to keep track of the location, condition and availability of Union's fleet of 50,000-plus cars, so that when a status inquiry comes in from a sales office, the computer will provide fast response with data on number, type and location of cars available for customer use. In effect, the system consolidates—in an IBM 360/30—records which formerly were maintained by several different departments within Union.

● **Systems blend.** W. J. S. Ellis, director of corporate systems and procedures, points out that UNIPAR "when fully implemented, will blend sales, production, marketing and financial data into an integrated information bank. It will enable us to anticipate the market rather than merely to react to it. Even now, for example, we can plan with a customer who is building a new plant and determine his tank car needs well in advance of the time his plant goes into production. When this data is processed, our production people can anticipate by as much as two years the types of cars that will be in demand."

Benefits customers, too

UNIPAR is also producing a direct economic benefit to customers, in matching numbers and types of cars to demand. This match, Ellis says, "precludes use of premium-price, special-purpose cars which sometimes are used inappropriately simply because they are available."

● **Repair control planned.** Phase 2 of the system, the production phase, will be largely an in-house application. Robert D. McEvers, Tank Car Division vice president and general manager, notes that Union's East Chicago, Ind., plant is being expanded, and "to help achieve efficient manufacturing operations, we have ordered a 360/40 which will be used for inventory control and production scheduling." Operations at all Union repair shops will also be controlled on the basis of information available through the data bank: "From precise computer data, we will be able to determine if maintainance scheduling is in line with customer needs."

Phase 3, last in line for implementation, will more completely integrate marketing data into the system, along with accounting and personnel information. ■

WHEN YOU'RE READY TO SHIP GOLD DUST, COME TALK TO ACF

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for example
of dry bulk goods
Center Flow load
because you can
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And they prevent
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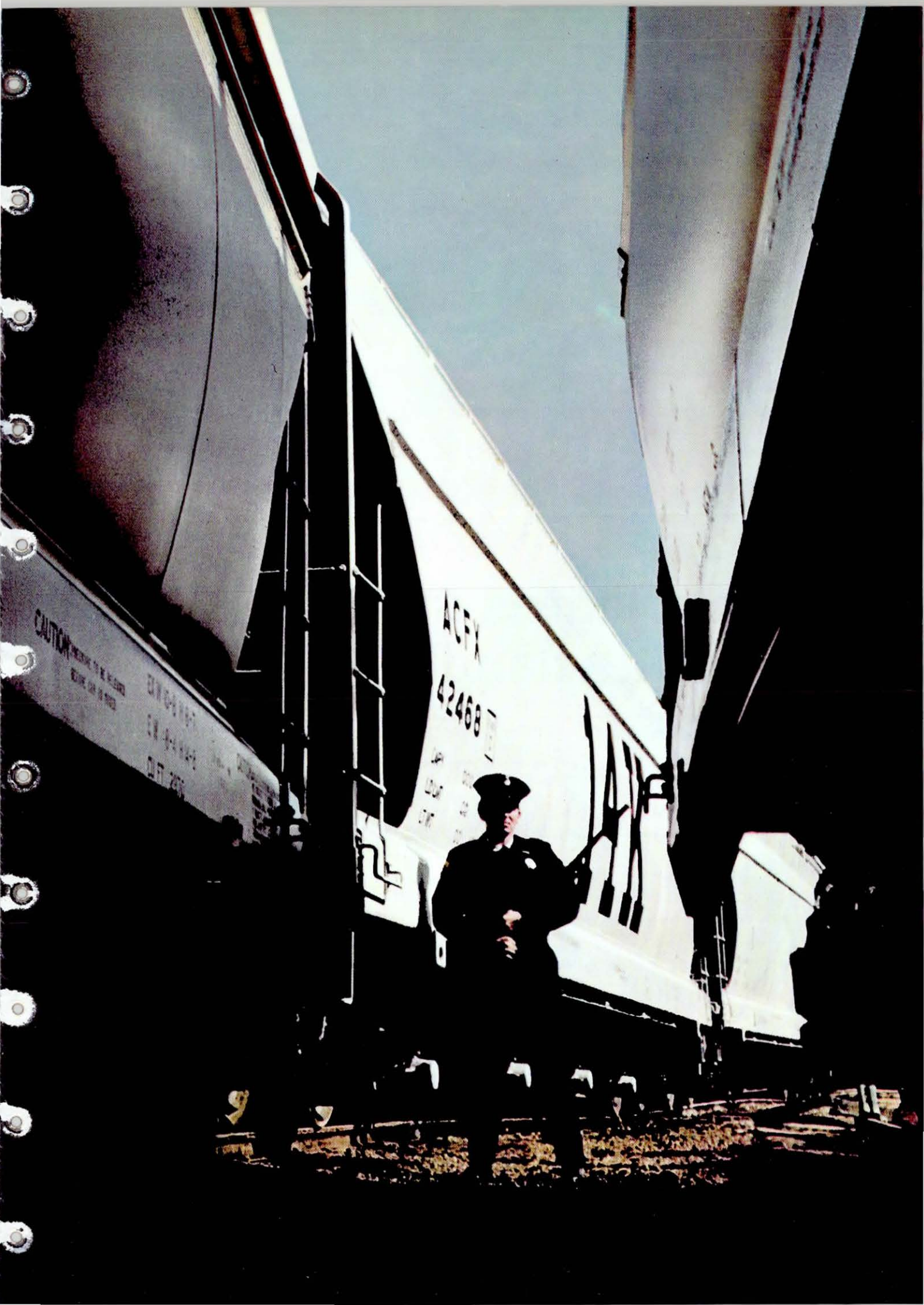

ACFX
42468

GOING SOMEWHERE FAST—Employees check shipments going through marking area at automated CP Express terminal in Montreal. Note tipping device at right.

CP automates small shipments handling

Two new CP Express terminals in Montreal and Toronto are called vital links in the road's multi-modal systems for movement of goods by land, sea and air.

High speed sorting of thousands of small shipments is the basic function of two new CP Express terminals in Toronto and Montreal. In essence, the $5-million terminals are self-contained, inter-vehicle transfer systems linking the larger transportation network of CP Express with forklift trucks, conveyors, powered sorting rings and automated in-floor towlines.

● **Multi-Modal link.** Handling up to 100 pieces per minute. the terminals are designed for the safe and efficient handling of customers' traffic, says Ian D. Sinclair, president of Canadian Pacific. "They will be vital links not only in the CP Express transportation system, but also in the broader context of Canadian Pacific's multi-modal systems for movement of goods by land, sea and air."

"A fantastic amount of planning has gone into these buildings," explains K. W. Dickins, CP Express manager of planning. "The variety of protections, stops, sensors, timers, releases and pushbuttons that interlock and serve one another has to be seen to be believed."

Incoming express freight received via trucks or rail is loaded onto towcarts which are then dispatched along towlines that move through slots in the terminal floor. A completely automatic, magnetically activated switching system directs the loaded carts into the appropriate outbound spur for unloading. If the spur line is full, a pin on the front cart depresses a bar in the floor slot which locks the line switch closed and prevents additional carts from entering. Carts destined for full spurs continue around the main towline until space is available, while those with packages for several destinations are routed through the sorting area.

Carts entering the sorting area move onto a separate section of track and are mechanically tipped, permitting the packages to slide off, where they are then picked up by roller conveyor for marking. When a package is stopped for marking, ensuing packages stop as soon as contact is made with the initial package. No pressure is exerted on the package being marked.

Two or three conveyor belts run from the marking area directly to outbound vehicle doors to expedite small shipment traffic to heavy outbound routes. The remainder of the traffic continues on normal conveyor belts to one of two double-tiered sorting rings. There they are placed on carts and coded for outbound loading areas. However, explained Dickins, "Items such as batteries, paint, loose steel or car parts, heavy films, eggs and other fragile commodities are never sent to the sorter. This rule also applies to any package that weighs more than 50 lb or is larger than 2 x 2 x 4 feet."

Interchange lines allow towcarts to move from one main loop to another and are equipped with automatic stops to avoid collisions at transfer points. A sensing device on the main line in front of the point of interchange determines whether a space is available. The moment an unoccupied space is detected, the cart on the interchange line is released and moves forward to complete the transfer.

Safety is an important aspect of the terminal operations. When towlines are started, a warning horn sounds for 5 seconds before the line actually begins to move, providing ample time for employees to move clear. A similar delay occurs when lines are stopped.

Emergency towline stops are strategically located throughout the dock areas. Safety devices automatically stop improperly loaded carts from using the tipping mechanisms. Forklift trucks can then gain access to the carts, due to a minimum 15-foot clearance between towlines and doors. ■

RAILWAY BOOKSHELF

THE GOLDEN SPIKE IN SOUND—The official souvenir album of the Golden Spike Centennial Celebration Commission is a good gift for rail historians, railroad buffs and almost anyone with an interest in 19th century America (Mark 56 Records, Anaheim, Calif.; 2 stereo discs; $15). Narrations by actors Victor Jory and Ed Begley recapture the flavor of the Golden Spike events of a century ago as well as old-time railroading in general. Carl Sandburg and the original Joplin Forte (a folksong group) sing old railroad songs. Still other songs are presented by means of a big band sound. There is also a series of recorded railroad sounds, including steam whistles.

•

HIGH ROAD TO PROMONTORY by George Kraus (American West Publishing Co., Palo Alto, Cal., $9.50) is the story of the construction of the Central Pacific (now Southern Pacific) across the Sierra Nevadas and over the arid deserts of Nevada and Utah. Along with its descriptions of the physical barriers to the building of the western segment of the nation's first transcontinental, there are also discussions of CP's corporate problems, political involvements and its social implications. Many first-hand accounts and more than 100 photographs are included.

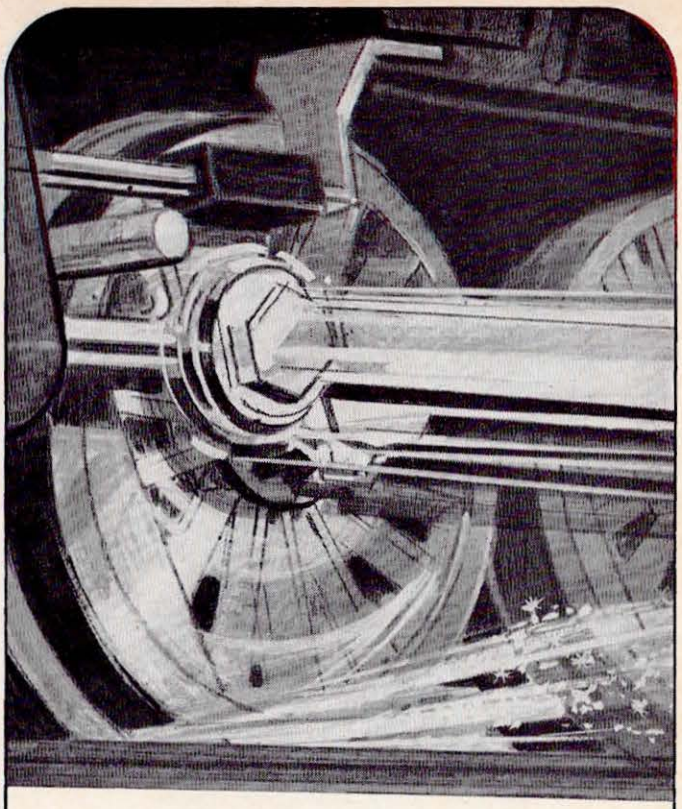
•

WESTWARD TO PROMONTORY by Barry B. Combs (American West Publishing Co., Palo Alto, Cal., $10.75) was prepared in cooperation with the American Geographical Society and includes the contemporary photographs taken by A. J. Russell who followed the building of Union Pacific with his little horse-and-buggy "dark room." To portray the building as vividly as possible, these scenes are reproduced with special printing on heavy paper. Historian-author Combs enriches this collection with his thoroughly-researched captions while his accompanying text tells why and how the UP came to be the eastern partner in America's first transcontinental railroad.

•

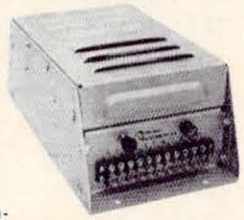
THE GOLDEN SPIKE—A CENTENNIAL REMEMBRANCE (American Geographical Society, New York, $5.00) is basically a collection of three American Geographical Society papers by early members—Henry V. Poor, editor and early advocate of the building of the Pacific Railroad, and James Douglas, metallurgist and pioneer developer of Western mining. In his foreword, Union Pacific Chairman E. Roland Harriman hails the foresight of early prophets of the iron horse who predicted the inevitability of greater days of America. Harriman points out that the engineers, builders, financiers and operators of the pioneer railroads of the West made possible the mapping and construction which ultimately produced also the freeways and airways that today crisscross the nation. Henry V. Poor, editor of the American Railroad Journal (now Railway Locomotives and Cars) from 1849 to 1862, was such an advocate of the Pacific Railroad that he was chosen provisional secretary at UP's preliminary organizational meeting in 1862. Poor early appreciated the importance of federal financing of the transcontinental line, pointing out its importance in

(Continued on page 91)



stops slipping starts gripping

Summit Locomotive Electronic Wheel Slip Control System from Barco



When locomotive wheels start to slip, the Barco-Summit Electronic Wheel Slip Control takes over instantly. Using the Rate-Of-Change principle the control reduces power in a split second. Besides eliminating wheel and rail damage, the Wheel Slip Control allows longer trains to be pulled with the same power. Available for both AC & DC locomotives. Can be installed in the field on older locomotives.

The Barco-Summit Locomotive Wheel Slip Control System is ruggedly designed and its performance is proved. There's no interference with normal locomotive function and locomotive electrical circuits remain unaltered. For more information on this system, just write Aeroquip Corporation, Barco Division, 500 Hough St., Barrington, Ill.

Aeroquip products are protected by patents internationally.

BARCO

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Circle 58 on coupon page 109

Frank Malone

WATCHING WASHINGTON

WHAT OTHER MILESTONE besides the cross-continent centennial can 1969 mark? A legislative milestone, you might answer, if you've been watching the Capitol scene. The bills that rails are pushing this year could, if enacted, inject a vast amount of new energy into the industry. Such enactment would put 1969 on a par with 1869 as a memorable railroad year.

THE ASSOCIATION of American Railroads is drafting a hot-potato bill for common ownership. Rails want legal freedom to operate other transport modes. Like Canadian Pacific, U. S. rails want to give department-store service through train, truck, ship and plane arms.

AAR SEES common ownership as essential for railroad survival as a private competitor for the transport dollar. You'll find this same vision behind the other proposals, especially those concerning taxes. With two burdens not felt by competitors, rails face everyone's rising costs. The two burdens are the lowest transport return on investment, and full responsibility for upkeep, while other modes enjoy large helpings of federal bread. Caught in a squeeze, rails are looking for relief through protection against discriminatory state and local taxes, allowance for expenses of various reorganizations such as mergers, and freedom to set more competitive prices for their services.

NONE ARE NEW proposals. Most have made the biannual trip to the Hill since 1960, at least. Among many obstacles, they've faced the growing belief that rails long ago lost Congressional popularity. They also have lacked what many observers consider crucial—direct support from the White House.

ALTHOUGH the AAR program is set, you'll have a hard time getting a timetable for the bill introductions. The intricacies of Hill lobbying, especially from the angle of timing, make it difficult (and in some cases, undesirable) to say when a proposal will go up. Nevertheless, Thomas M. Goodfellow, AAR president, looks for action: "We're going to make this one of our hardest-driving years for legislation needed to move rails into the next hundred years." The proposals may only get introduced and started on their way through the gauntlets of Hill commerce committees. But even that, you might agree, would be enough to mark 1969 as a milestone toward a possible Golden Law celebration.

STUDY CAR MAINTENANCE & INSPECTION in spare time at home

Ever notice the respect given someone who knows more about the work than the next guy? It's usually "Ask Joe" or, "See what Joe thinks about this." While that knowledge won't always add to the pay check, it does pay off in great job satisfaction and personal pride. And who can put a dollar value on that?

You can be such a man by taking this two-year course for car department employees whose work requires an intimate knowledge of car maintenance and repair. Two lessons a month, in simple, non-technical language, guide you swiftly to a better working knowledge of the subject. Your lessons will be graded by experienced instructors who give individual, personalized advice as needed. The cost is low and payable in monthly installments. For full information, return coupon.

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Send full information on carman and car inspector home study course.

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Railroad_____

Job title_____

RAILWAY BOOKSHELF

(Continued from page 89)

unifying the nation. Douglas traced the role of the Spanish, French and Anglo-Saxons in opening the American West, culminating in the enterprise which had produced five transcontinental routes in the 16 years following Promontory. The volume closes with a bibliographical introduction to railroad history.

●

TRANSPORT ECONOMICS IN DEVELOPING COUNTRIES by A. R. Prest (Frederick A. Praeger, New York, $7.50) is a study of contemporary approaches to problems much like those facing the expanding United States of the 1860s. Presented is a systematic analysis of modern developments in pricing and financing public transport enterprises with discussions of such policies as direct user charges, the possibilities of charging non-user beneficiaries, and the various means of making government subsidies available.

●

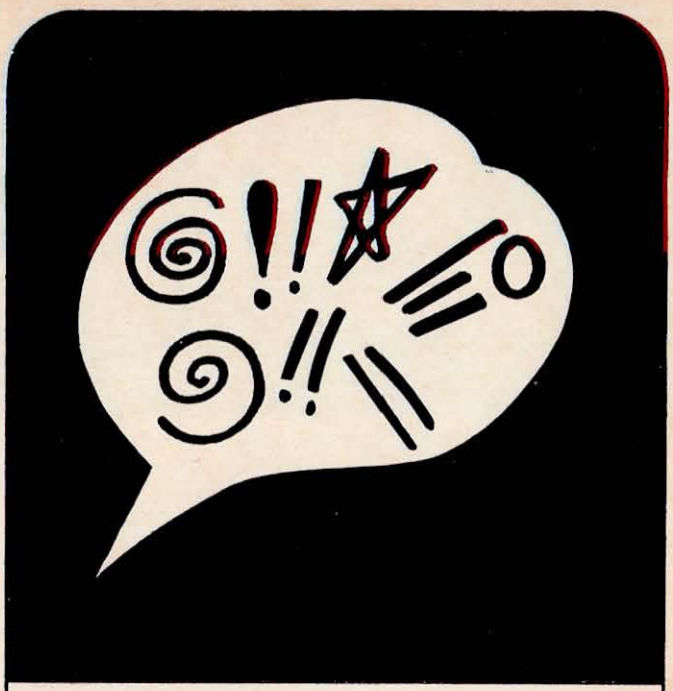
TRANSPORT AND NATIONAL GOALS edited by Edwin T. Haefele (The Brookings Institution, Washington, D.C., $6.00) is the eighth book prepared as part of the Brookings Transport Research Program and financed by a grant from the Agency for International Development (AID). Because transport planning is closely related to many aspects of national development policy, merely weighting the costs and benefit of alternative means of moving people and goods is not enough. The possibilities of trade-offs between transport investment and other capital investments must be taken into account. Because of the diverse effects on other economic programs, an apparently efficient transport investment may actually be inefficient when viewed in the broader context of national planning.

●

TRANSPORTATION AND ECONOMIC DEVELOPMENT IN LATIN AMERICA by Charles J. Stokes (Frederick A. Praeger, New York, $12.50) warns that for too long there has been a complete separation of engineering decision making from the economics of transport. The author stresses the importance of cost/benefit analysis for each major transportation project, pointing out that "a major highway decision might be made on engineering capability and intrinsic evaluation without regard to the role of this investment in achieving the normal economic development goals of a nation." Examined are three case studies—Venezuela, where superhighway investment has virtually eliminated the national railways; Colombia, where the integration of the traditional transport modes may not have been properly directed, and, finally, a proposal for an international north-south highway along the undeveloped eastern foothills of the Andes.

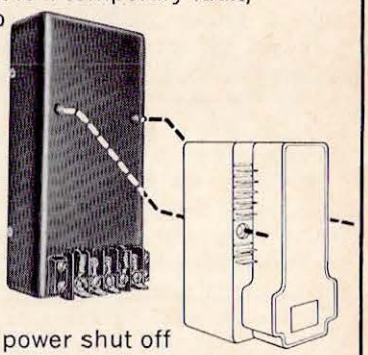
●

TRANSPORT TECHNOLOGICAL TRENDS by the research staff of the Transportation Association of America (TAA, Washington, D.C., $10.00) contains brief across-the-board status reports of major current and pending transportation innovations along with possible national policy implications. Comments and "pros" and "cons" as seen by reputable sources are also given. Statistical data on each mode introduces its section, with traffic and investment trends shown.



It is better to use a BARCO Automatic Reset for Ground Protective Relay than to curse the darkness

When a power overload or short circuit shuts off an electrical system, it's a nuisance . . . and often times, costly. If it is a temporary fault, your crewman must go and reset it manually. If it recurs again and again, it could cause an expensive breakdown.



With the Barco Automatic Reset for Ground Protective Relay, you control both of these problems. Once installed, a temporary power shut off is reset automatically and operation continues as before. If the problem is a permanent one, after four trips the Barco System will not reset, and thus prevents possible damage to major electrical components.

For more information on how the Barco Automatic Reset for Ground Protective Relay can keep you from cursing the darkness, write Aeroquip Corporation, 500 Hough Street, Barrington, Illinois. *Aeroquip products protected by patents internationally.*

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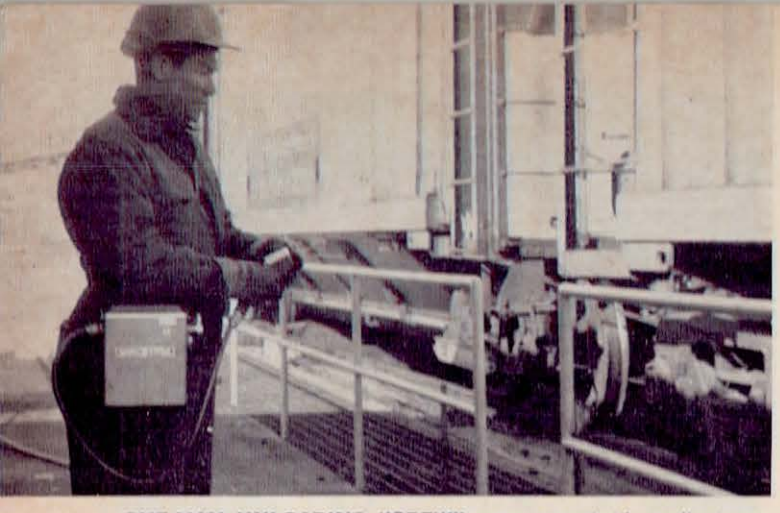
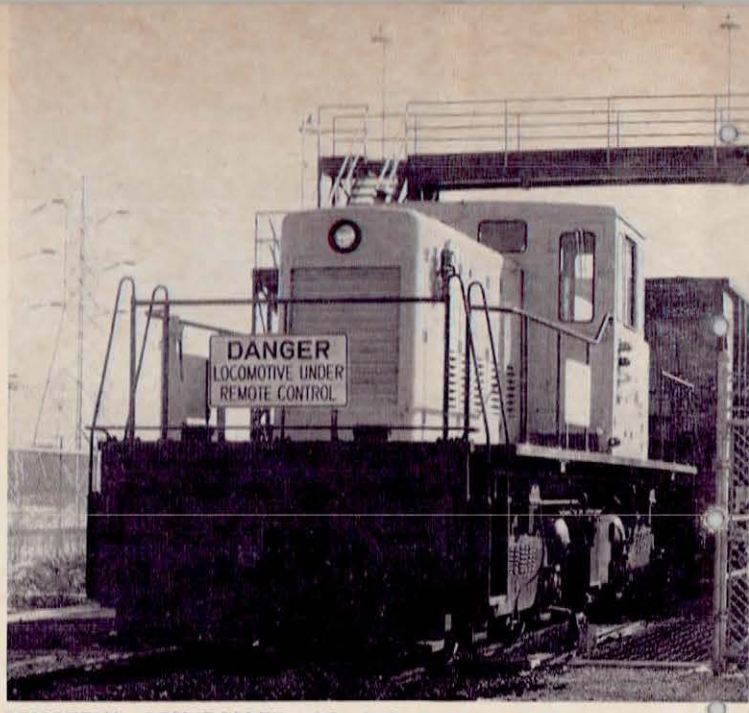


ONE-MAN UNLOADING "CREW" uses a portable radio transmitter to control movement of 100-ton hopper cars over the coal receiving hopper at Indianapolis Power & Light Co.'s Petersburg, Indiana, turbo-generator power station.



REMOTELY CONTROLLED GE industrial switcher powers the

Unit-train coal is dumped by one man

Thirty-one-car trains, carrying 3,100 tons of coal, are normally unloaded in about 1½ hours.

The unit-coal-train operation serving Indianapolis Power & Light Company's 250-megawatt turbo-generator power station near Petersburg, Indiana, isn't apt to endanger any current railroad tonnage or distance records. But it should rank near the top in delivery speed and automation, and the trend-line jump its growth chart should take before mid-year would warm the cockles of the heart of most sales vice presidents.

● **3,100 tons a day.** Operating out of Peabody Coal Company's Lynnville (Ind.) Mine over a 24-mile section of the Penn Central's Terre Haute branch, the 31-car unit trains linking the mine with the generating plant are now delivering 3,100 tons of coal daily, five days a week. But, by the middle of this year, that volume will be like a light evening snack for the Petersburg station. IPL is currently in the midst of a $48.5-million expansion program which will more than triple the station's power output, to 700 mw. Accompanying the program will be a similar threefold boost in coal consumption.

The Petersburg plant, on the White River a short distance downstream from the confluence of its east and west forks, sent out its first ampere of current from Unit One in mid-1967. When Unit Two, rated at 450 mw, becomes operational this year, the plant will be the largest serving IPL customers in the Hoosier State's capital city of Indianapolis, 120 miles to the north.

The coal now hauled daily in the unit trains is churning the power plant's turbo-generators often within 16 hours after being mined at the Lynnville strip mine site. The 62 100-ton coal cars used in the operation are owned by Peabody and operated as a pair of 31-car unit trains. They are playing a major role in the rapid coal-power-to-electrical-power transformation. Along with perhaps another group of new cars with similar physical characteristics, they are expected to figure heavily in the current and long-range plans IPL has for the Petersburg operation.

● **Fast unloading.** The unit trains are composed exclusively of the 62 Peabody cars. They began operating at full capacity and on their regular schedules last year, shortly after the Petersburg plant joined IPL's power network. The striking yellow and green cars, with Reddy-Kilowatt emblazoned on their sides extolling the virtues of electric living, are 46 ft. 5 in. long, 10 ft. 7 in. wide, 13 ft. 7 in. high. Each has a capacity of 4,040 cu. ft. Designed by FMC and built by both FMC and Bethlehem, they are light in weight—only 57,000 pounds—and feature an electro-pneumatic mechanism for operating their longitudinal hopper doors. The special mechanisms, chosen to speed unloading and thereby keep unloading costs at a minimum, are designed to be triggered automatically by low current 36 VDC supplied at trackside in the generating plant's coal receiving area.

Each car coupled in the unit trains is capable of unloading its 100-ton payload "on the run" in about nine seconds—a pace which the plant's take-away conveyor system actually cannot match. Thus, to avoid the serious problem of overloading the system (capacity: 1,800 tons per hour peak), each unit train arriving at the plant is cut into three 10- or 11-car blocks before being shuttled over the subsurface, between-the-rails receiving pits. This procedure does prevent full exploitation of the cars' automated features, but it is not now creating any serious kinks in train schedules. As the plant expands, however, the time consumed in unloading may become more critical.

"We expect to remedy this shortcoming before Unit Two goes into operation this year," says Robert Readle, plant superintendent. "As a matter of fact, a portion of the money being spent here will go toward increasing the flexibility of our coal conveyor system so that we can take full advantage of the cars and the trackside dumping controls."

Also, to prevent any delays which can develop due to coal "freeze-up" in the cars following loading and during the short 24-mile trips from the mine in winter months, a thaw shed along the track approach to the dumping area could be installed.

● **One-man show.** Even though the full potential of the cars' rapid discharge capabilities is not being used now, the 3,100 tons of coal received daily are dumped normally in about 1½ hrs. And, normally, it is a one-man show.

IPL cars through the unloading procedure.

To maintain the five-day-week delivery schedule, the Peabody cars are loaded—also automatically, in less than eight minutes each—at Lynnville Mine in late afternoon. Delivered to the power plant in the early hours of the next morning, the 31 cars are spotted on the plant's new 11,000-ft. siding to await the plant's day shift. "It's a real clock-work operation," said George Akard, the plant's supervisor of operation, referring to the delivery, unloading and return of the train to the Lynnville Mine for reloading.

The electronically-controlled triggering system which initiates the dumping action at the unloading area was designed by General Electric's Transportation Systems Division to blend with the electro-pneumatic mechanisms on the Peabody cars. The system has four strategically-located spring-loaded pick-up shoes, not unlike those used on electrically-propelled mass transit cars. They are set at a height beside one rail where they will make contact with one of the aluminum I-beam rails attached to the trailing trucks at the AR and BL corners of each car.

As a string of cars is moved slowly into the unloading area, one of the first car's I-beam rails will make contact with an energized shoe (in automatic operation, the Number Three shoe is the first one energized) and transmit the 36VDC signal to a solenoid coil on the car. The coil, in turn, operates an electro-pneumatic valve which applies 80-psi air to one side of four two-way cylinders, thus opening all eight longitudinal doors (4 per side) at one time. The pressurized air for the cylinders is stored in a reservoir at the "A" end of each car.

● **Nine-second job.** Elapsed time from receipt of the signal until all 100 tons are discharged is about nine seconds. The second car in the cut is activated when contact is made with Number Two shoe, the third car by Number One. Then the sequence is repeated until all cars are unloaded. Meanwhile, Number Four shoe, at the outbound end of the unloading area, is programmed so that it remains energized at all times. When a car's I-beam rail makes contact with it, its reverse polarity signal will initiate the door-closing action. In this case, the air pressure will be applied to the opposite ends of the two-way cylinders.

If the IPL operator should so choose, he can easily set the system for manual operation. Or, if there is a malfunction in a car, he can activate the door-operating cylinders with auxiliary air provided at trackside.

An IPL-owned General Electric B-B 220/220 industrial switcher, remotely-controlled by the one-man unloading "crew," powers the cars through the unloading procedure. Another of its functions is to charge the reservoirs for the pneumatic door-operating cylinders on the cars. The unmanned, radio-controlled switcher is equipped with a "creeper" control which permits three-speed operation—from as slow as ⅛ mph to a maximum of 4 mph. The desired speed for unloading (IPL chooses the slower speed) is selected manually in the cab prior to the start of the operation. In "creep" operation, the locomotive's four traction motors are connected in series across one of the locomotive's two DC generators. A selector switch in the cab permits alternating between the two generators periodically to assure even wear of the engines.

"All operating functions normally performed in the locomotive cab, including blowing the horn and sanding the rails, can be handled from trackside with the radio control unit," says Wayne Lewis, area engineer in GE's installation and service engineering department. "And, should the operator accidentally depress any two buttons simultaneously, the locomotive will come to a complete stop."

When unloading is completed, the switcher returns the unit train intact to the plant's siding. Later in the day it is picked up by a PC crew and returned to the Lynnville mine for the next afternoon's loading.

● **Stockpiling policy.** The Petersburg plant has a reserve stock-pile of over 200,000 tons, and it is being gradually increased. Explaining the stockpiling policy, Akard says, "Our goal is to have at least a 90-day supply on hand. With this amount in reserve, our production can be maintained even if we are faced with a complete shut-off of incoming coal."

What will happen when the 450 mw Unit Two is added next year? "We will boost our stockpile so as to reach approximately the 90-day level," Akard says. Since daily consumption will spiral up to around 6,100 tons, this figures out to be a mountainous reserve of 549,000 tons.

Not only does the Petersburg plant figure prominently in IPL's immediate expansion programs, but it also looms very large in the power company's long-range plans. The Petersburg property is spacious enough to handle a total of five generating units and, with IPL's hourly peak demand substantially above the 1 million kilowatt level—double the peak of 10 years ago—the units will make their eventual appearance to permit the power supply to keep pace with the city's projected growth.

Peabody, which has a 30-million ton contract to supply coal for the Petersburg operation, is keenly aware of the implications of the expansion program now under way. About one-third of the Indiana Number Six coal scooped out of the Lynnville mine each day goes to the Petersburg plant. A good portion of the remainder goes by railroad-owned cars to more distant IPL generating stations. When Unit Two becomes operational in mid-year, or perhaps even before, Peabody will have to be prepared to deliver to Petersburg somewhere around 50,000 tons of fuel per week.

● **More car buying ahead?** To meet the demand, either the unit train schedule will have to be beefed up or the Peabody car fleet will have to undergo an expansion program of its own. "We have yet to finalize any plans on how to meet the impending demand," reports Donald Johnston, Peabody's vice president-administration. "But, should we decide to purchase additional cars for the Lynnville-Petersburg run, they'll no doubt be of the same design and operating principle as the ones now being used."

If the final decision were up to IPL officers, there would be an overwhelming vote for more new cars similar to the 62 now in operation. Before arrival of the new Peabody cars a year ago, both railroad-owned open top hoppers and manually-operated quick-dump leased hopper cars were used for a brief period. "Our people at the Petersburg plant have indicated that the new Peabody cars are satisfactory and are keeping handling costs to a minimum," advises William Cannicott, IPL's purchasing vice president. ■

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1968 ANNUAL REPORT

TO OUR STOCKHOLDERS:

Despite sharply increasing inflationary pressures and the effect of the 10% Federal income tax surcharge (9 cents per common share), Union Pacific earnings on an ICC basis increased in 1968. Net income on this basis amounted to $102.7 million, or $4.45 per common share (after preferred dividend requirements) compared with $102.1 million, or $4.42 per common share, in 1967.

On the basis of generally accepted accounting principles, earnings were $77.5 million in 1968, or $3.32 per common share compared with $80.7 million, or $3.47 per common share in 1967. The decline reflects an increase in deferred income taxes due principally to the higher tax rate in 1968.

Divisional Net Income

Net income for 1968, as allocated to Divisions, compared with 1967, is shown below:

	1968	1967	Increase or Decrease
Transportation Division	$ 79,841,223	$ 85,302,705	−$ 5,461,482
Natural Resources Division	12,968,353	13,716,578	− 748,225
Land Division	3,843,535	92,510	+ 3,751,025
Non-Divisional	6,081,094	3,021,244	+ 3,059,850
Total (I.C.C. basis)	$102,734,205	$102,133,037	+$ 601,168
Deferred Tax Adjustment	(25,200,000)	(21,400,000)	+ (3,800,000)
Net income under generally accepted accounting principles	$ 77,534,205	$ 80,733,037	−$ 3,198,832

Freight Business Increased

The Transportation Division reported record freight revenue in 1968 due to increased volume of traffic and the effects of general rate increases granted in 1967 and 1968. Moreover, the steady decline in recent years in the net charge for equipment rents continued in 1968. However, these favorable factors were adversely affected by the impact on expenses of spiraling wage and material costs and the continuing sharp decline in passenger and mail revenues.

Oil production in Wilmington field continued to increase in 1968 as a result of the expanded water-flooding program. But net income from oil and gas operations declined due to reduced revenues from Patrick Draw field and rising maintenance costs.

Capital Improvements Progressed

Union Pacific's modernization and improvement program continued at a high level in 1968. New railroad equipment costing $61 million was acquired to strengthen the Company's competitive position and provide better service to customers. The Land

Division and its affiliates spent $15 million in 1968 for prime land acquisitions as part of its expanding efforts to promote industrial development on the Union Pacific.

Merger Developments

The protracted hearings on the Union Pacific-Rock Island merger case were concluded on August 22, 1968. Filing of briefs was completed on March 10, 1969, and the ICC examiners will in due course submit their recommendations to the Commission.

Holding Company

The organization of a new holding company, Union Pacific Corporation, was announced on January 30, 1969.

Chairman Harriman

After long years of loyal and dedicated service to the Union Pacific, E. Roland Harriman, Chairman of the Board of Directors, became Honorary Chairman of the Board effective January 30, 1969.

Loss of Directors

We record with sorrow the death of two Directors early in 1969.

Arthur E. Stoddard, who retired as President of the Union Pacific Railroad Company at the close of 1964, after serving 16 years in that position, died on March 24, 1969. Mr. Stoddard had continued as a Director of the Company following his retirement.

Willard B. Millard, Jr., who was Chairman of the Board of The Omaha National Bank, died on January 3, 1969. Mr. Millard had served as a Director since 1963.

New Director

At the meeting of the Board of Directors held on February 27, 1969, Morris F. Miller of Omaha, Nebraska, was elected a Director of the Company.

Planning for the Future

In this year of our Centennial Anniversary, while we look with pride on the historic achievements of the Union Pacific during the past century, we are also moving forward toward the attainment of higher levels of growth and prosperity for the Company in the years ahead. To meet the exciting challenges of today and tomorrow, strategic corporate plans are being formulated and implemented with the goal of bringing maximum benefits to our customers, our stockholders, our employes and the communities we serve.

FRANK E. BARNETT
Chairman of the Board of Directors

JAMES H. EVANS
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Chairman of the Executive Committee

EDD H. BAILEY
President

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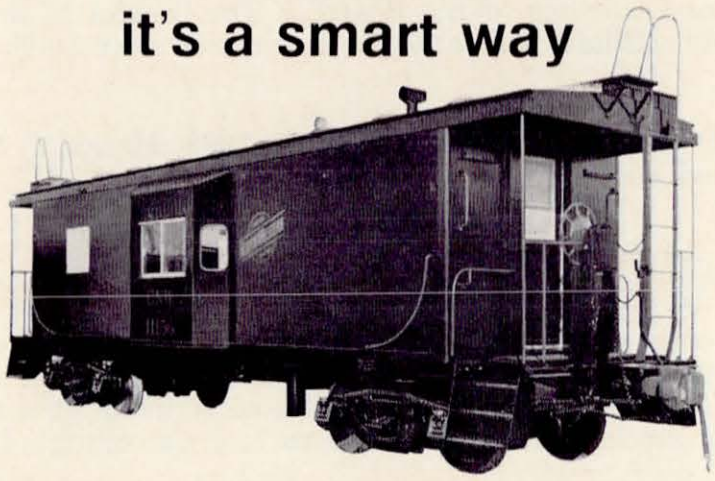

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Circle 44 on coupon page 109

LETTERS

Ike's last rail journey

Roanoke, Va.

To the Editor:

The article about "Ike's Last Rail Journey: The Inside Story" [RA, April 14, p. 24] was an excellent presentation of the facts attendant upon the operation of the funeral train.

Many of my good friends in the railroad industry lost a lot of sleep and worked many extra hours that contributed to the success of the train, and I would like to commend your publication for it's defense of the railroads involved in the operation.

As indicated in your article, plans for this train were formulated well in advance, and the selection of baggage car 314 was made in compliance with the wishes of the family. The advance preparations of the C&O-B&O in completely reconditioning the car, which included a new paint job, was indicative of the thoroughness of the railroads involved.

The car was in the Washington Yards several weeks before the event transpired, and some of the paint peeled from the roof in small patches. In an effort to present the best possible appearance, paint was sprayed over the patches, which was apparently witnessed by one of the news reporters, and led to the misconception that proper preparations had not been made, and that the car was an old one.

Please accept my sincere congratulations on this fine article, since it is a distinct contribution to the railroad industry, and the outstanding principles for which it stands.

A. M. Bixby
District Sales Manager
Dresser Industries, Inc.

Passenger subsidies

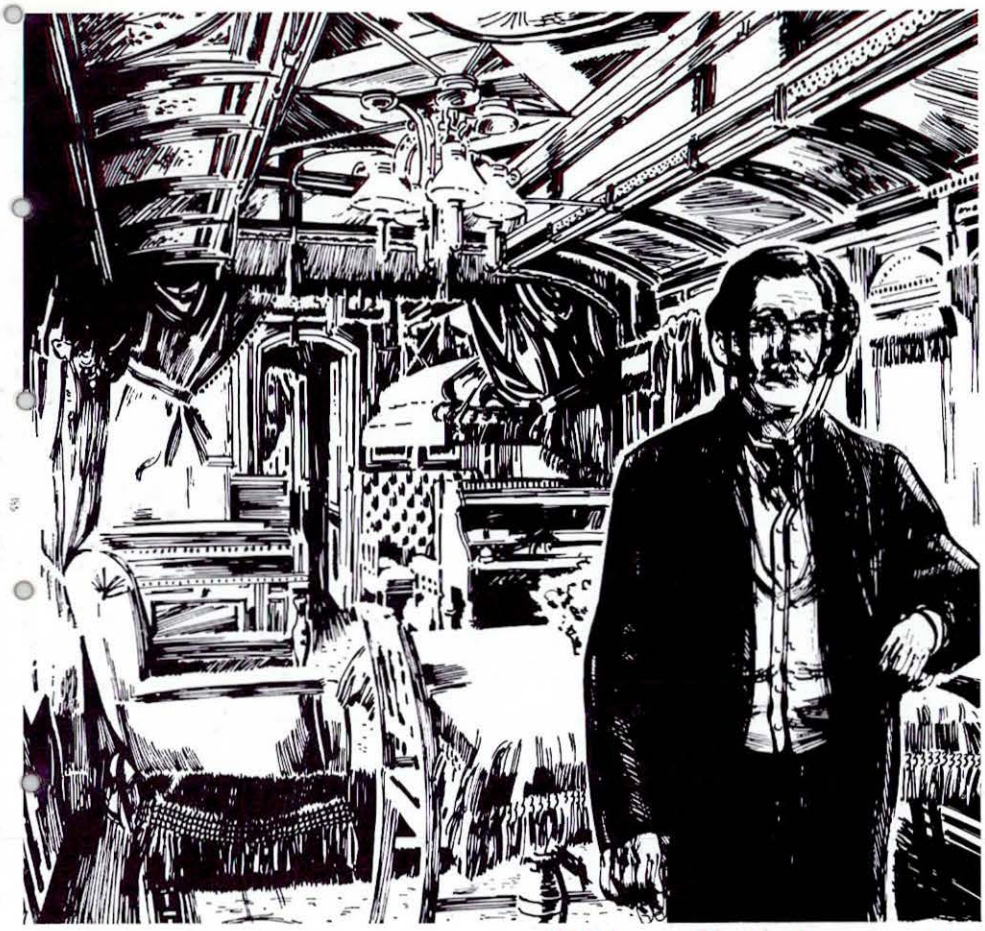
Somerset, Kentucky

To the Editor:

Regarding the report on answers to the question on passenger train subsidies as reported in your article "Shippers Split on Passenger Aid" in the March 31 isue of Railway Age:

I agree with the "no" vote. There is simply no reason to subsidize outmoded, uneconomical and *unprofitable* passenger trains. The rail industry and the Federal Government would only be supporting a "dead horse." I certainly agree that the shippers should not be required to pick up the tab from inflated freight charges and the taxpayer should not either. I am equally against air carriers receiving subsi-

(Continued on page 105)



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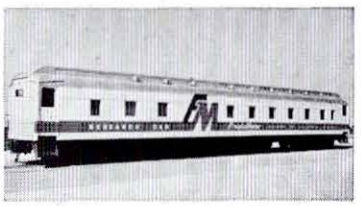

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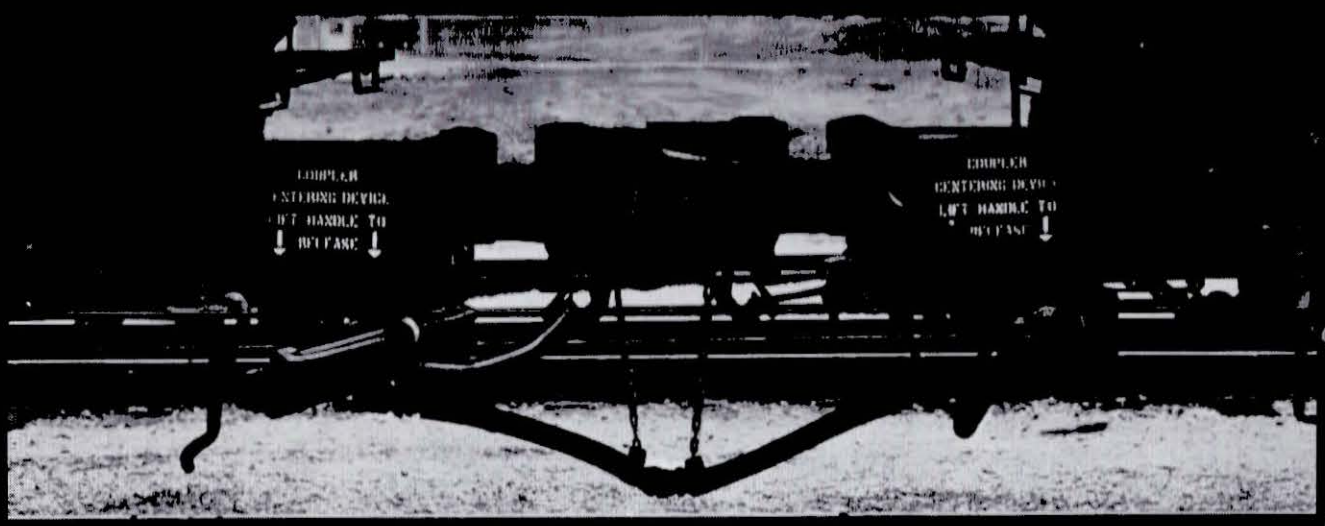

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By keeping a free coupler centered in relation to the end sill, they minimize the damage brought on by the passing of couplers.

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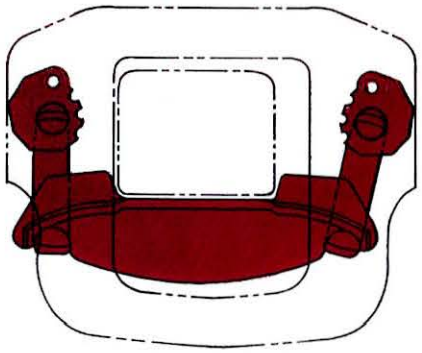
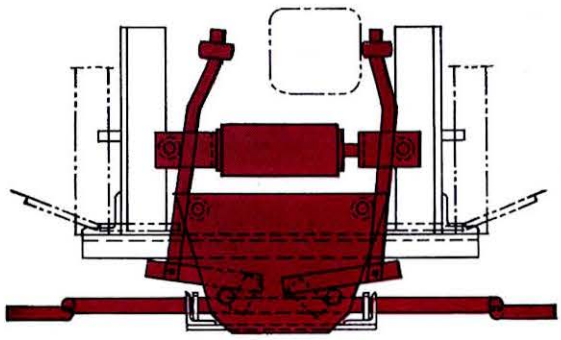
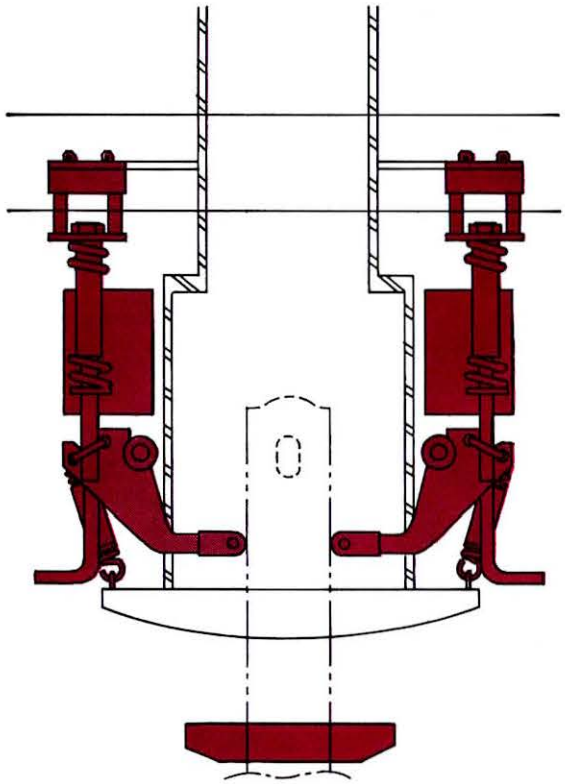


Swing Type
(includes carrier)



Single Coil Spring
(requires 6" space
behind carrier and under coupler)



Double Coil Spring
(requires 12" space
beside bell housing
under car floor)

Today's longer freight cars, with their long-shank couplers and wide-opening strikers, have required new centering device designs to meet the many car conditions. These new designs afford the same protection from damage that the Standard Centering Device has provided for many years—protection that is even more important with today's wide-swing couplers.

With a Standard Coupler Centering Device, the risk of passing couplers is reduced to a minimum. The device keeps a free coupler centered in relation to the end sill. If the coupler is swung wide when disengaged from another, the device instantly returns it to center position.

When the coupler is coupled to another car, the centering device permits all movements essential to safe operation . . . sideways, and up and down.

In using a wide-swing coupler device, there will be occasions when coupler alignment requires that a free coupler be moved off center. If so, a pull on the handle releases the centering device. As the cars move, and the coupler returns to center position, the device automatically re-engages.

Standard Coupler Centering Devices are supplied in four to six components, together with all necessary hardware and simple instructions for installing.

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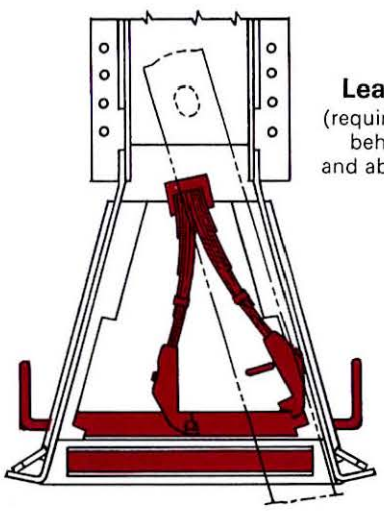

Leaf Spring
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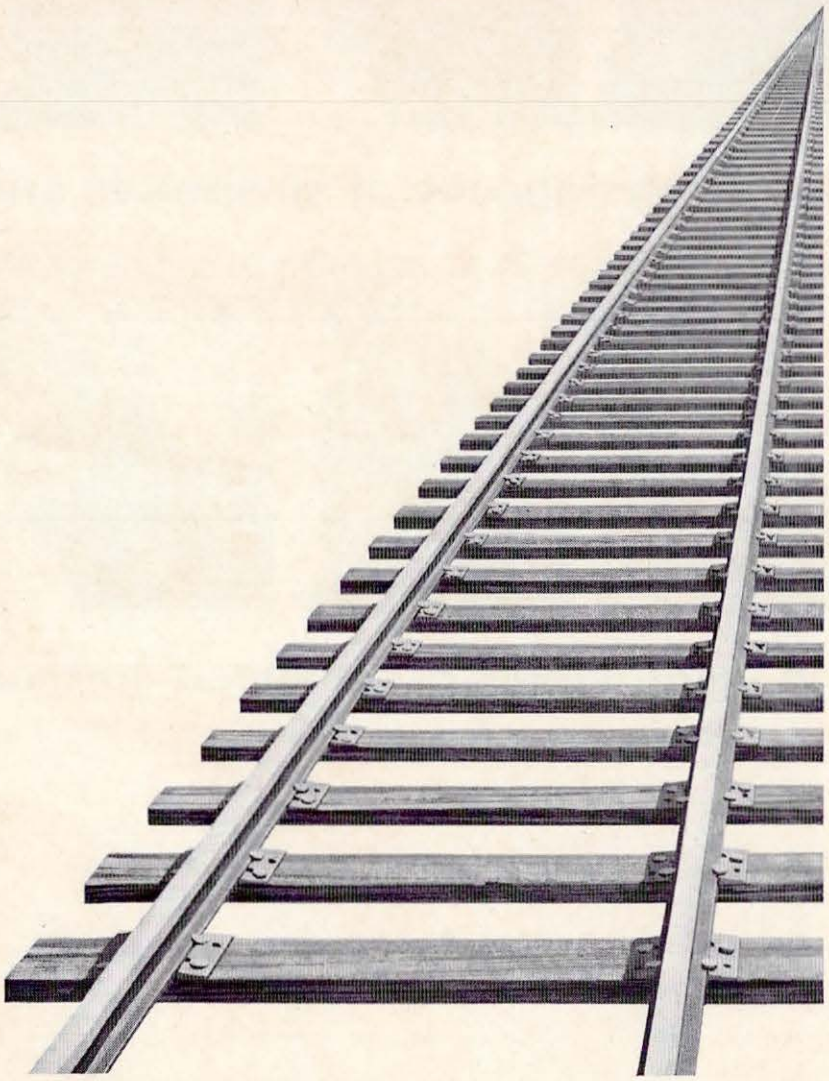

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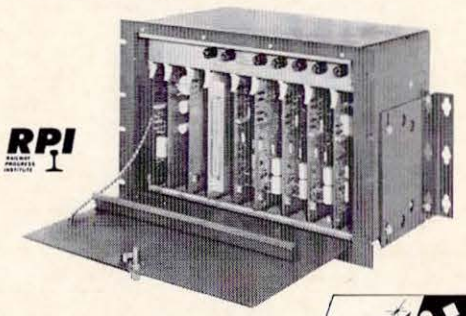

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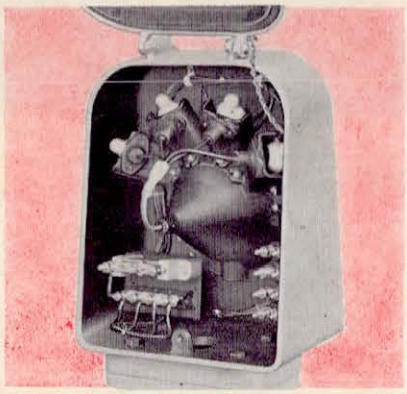

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Circle 46 on coupon page 109

LETTERS

(Continued from page 96)
dies for services not patronized and not needed; as in railroading or any other mode of transportation a service should economically pay its way or not be rendered.

I do believe that if there is any one point where the government might be involved it should be safety, and research and development, two areas railroading has sadly lacked progress in—as shown by frequent wrecks and derailments and no significant technological progress.

Alton B. Lanier

Passenger trains

New York

To the Editor:

So far as the public is concerned, railroads are nothing but fading Big Businesses in search of maximum profits and minimum obligations. The solution is a difficult and complicated one, but one major part of it is being ignored.

The public must somehow attain some kind of identification with railroading, and while the AAR's advertising campaign is a step in the right direction, it is an infinitesimal one so far as the average citizen is concerned. What else should be done? Hold on to your hats, but part of the answer is passenger trains. No, not the ones with sleeping cars, fancy diners, streamlined locomotives, and grandiose terminals. Even the "buffs" like myself are beginning to realize that the old fashioned passenger train, in spite of its amenities, is necessarily a thing of the past. But up-to-date passenger service must exist, and it will be in the interest of the railroads to take some of the initiative in this field.

Some good signs are the long overdue presentation by the AAR to the federal government of its passenger train subsidy proposals, Penn Central's Metro-liner, the TurboTrains, and Grand Trunk Western's passenger service revitalization. . . .

People don't love trucks, but they love their cars so anything the highway lobby can get away with is good. The majority of Americans still don't fly very much, but the public image of airlines and airfreight is one of courtesy, shiny metal, cleanliness, and "look at all the troublesome tests and inspections we go through just for your safety." A train, on the other hand, is old, dirty, and according to some, dangerous.

Let's change their minds.

Fred S. Wilson

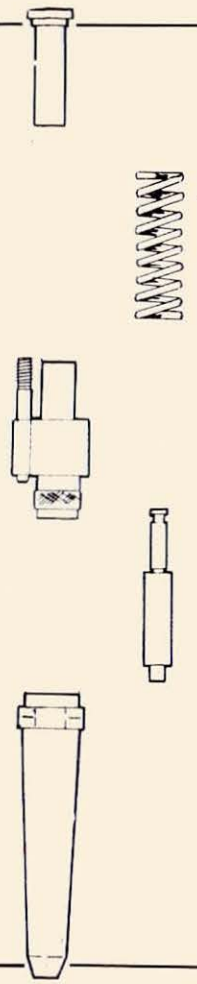
Tomorrow's railroads

Lackawanna, N.Y.

To the Editor:

. . . I want to compliment you on a very wonderful article in which I feel you have laid the groundwork for the new railroads which the RPI has been telling about all over the country. This puts into print a wonderful resume of just what the railroad management of today and tomorrow is going to have to do to keep up with the demands that are going to be placed upon it for transportation of materials, and people, in the future. I definitely feel that we are in a transportation business that is well based to be the leader and can most economically shoulder the tremendous task that has to be done.

Lester A. Crone
President
Buffalo Brake Beam Co.



Specialists in Fuel Injection and Governors

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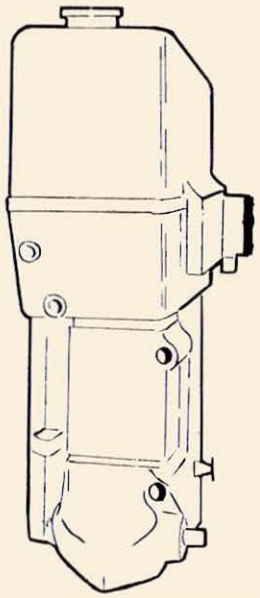
Any type Railroad Governors, Fuel Pumps and Injectors. Saves time and money, with full warranty.



SARDELLO, INC.

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Phone 412-264-1300
412-264-0829

MIDWEST FUEL INJECTION
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Chicago, Ill. 60638
312-767-6300

O. M. Provenzano
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C&O-B&O

J. W. Roberts, Jr.
C&O-B&O

Larry E. Long
Milwaukee

Philip A. Butler
PC

C. Robert Burr
PC

PEOPLE IN THE NEWS

ASSOCIATION OF AMERICAN RAILROADS.—E. Paul Miller appointed to the newly created position of assistant vice president, operations and maintenance, Washington. Mr. Miller will continue to serve as chairman, Car Service Division.

BALTIMORE & OHIO.—Oliver M. Provenzano, district sales manager, Hamilton, Ohio, named sales manager, Detroit. He will be in charge of all industry accounts except automotive business. **Kenneth J. Duncan** was recently appointed B&O's manager–automotive sales in Detroit.

CHESAPEAKE & OHIO—BALTIMORE & OHIO.—Jerome D. Krassenstein, market manager for the food industry, apppointed assistant vice president in charge of market planning, Baltimore. **Joseph W. Roberts, Jr.,** assistant market manager for food, succeeds Mr. Krassenstein.

Albert J. Sicnolf, public affairs manager, will be in charge of public relations activities in the District of Columbia and the State of Virginia. He will have continued responsibility for the public affairs program of the two roads and will maintain his office in Washington. Mr. Sicnolf replaces **Ted O'Meara,** regional public relations manager, Richmond, Va., who retired April 15, after 47 years of service.

CLINCHFIELD.—W. W. Grubb, staff assistant to general manager, Erwin, Tenn., appointed treasurer and purchasing agent, succeeding **E. E. Woodruff,** who retired April 7, after nearly 45 years of service.

ERIE LACKAWANNA.—C. William Stroh, assistant freight traffic manager, New York, appointed assistant to vice president, Cleveland, Ohio, succeeding **G. F. Mills,** who retired Feb. 28, after more than 40 years service. **Owen P. McKeever** appointed district sales manager, New York, succeeding **J. T. O'Neill,** retired. **Robert J. Randall,** piggyback terminal manager, Buffalo, N.Y., appointed regional sales manager, Chicago, succeeding **A. F. Gainey,** promoted (RA, March 31, p. 56).

MILWAUKEE.—Larry E. Long, employment and training officer, Chicago, named

(Continued on page 114)

"ASK THE ROADS THAT CARRY THE LOADS"

OVER

BOUTET Process
(IN-TRACK)
Rail Welding

Millions of Tons

Fast, Rugged Freight traffic

From Labrador to the Gulf . . .
From the Atlantic to the Pacific . . .
Extreme Temperatures

SAVE $800 PER MILE

DU-WEL

SPECIAL RAILROAD CASTINGS AND FORGINGS

DU-WEL STEEL PRODUCTS CO.
RAILWAY EXCHANGE BUILDING
TELEPHONE HARRISON 7-8257
Chicago 60604

Circle 51 on coupon page 109

Hand-thrown or remote-controlled

Hayes ALL-STEEL DERAILS

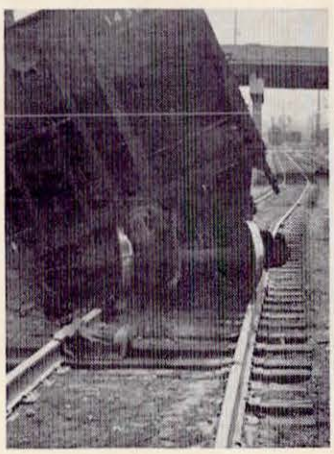
physically protect the main line

Derails or signals? Each has its place: signals are obeyed by men; Hayes Derails are obeyed by equipment.

When signals are not involved, the Hayes Derail alone is competent to keep the main track clear.

In modern signal systems, the Hayes Sliding Derail with DeLectric® Operator under remote control provides complete protection.

The "calculated risk" of omitting derails may be costly. Hayes Derail protection is inexpensive.



© 1968 H.T.A. Co.

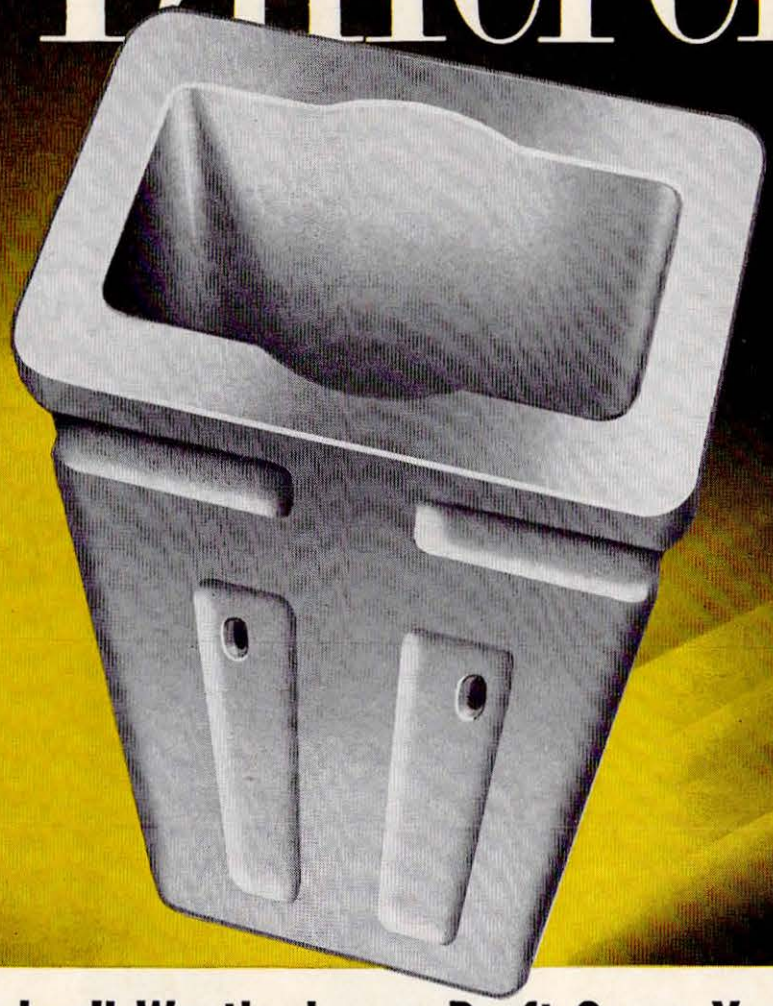
Free leatherette ring-binder catalog of world's most-specified derails, bumping posts and wheel stops (including periodic supplement sheets). Write on letterhead.

Track safety devices that WORK at the job.

Hayes Track Appliance Co.
RICHMOND, INDIANA 47374

Circle 52 on coupon page 109

the Difference

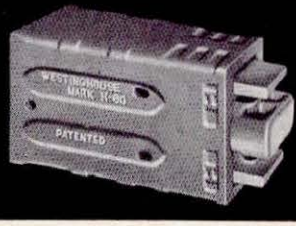


that makes Cardwell Westinghouse Draft Gears Your Best Buy

MARK 50

MARK R-500

MARK H-60



The housing is a costly component of any draft gear. The difference in this draft gear housing is durability and dollar savings • Friction plates located on inner surfaces *eliminate wear on the housing*. Long life and reuse assured • One-piece design cast in high-grade alloy steel • Heavy side walls provide unusual column strength and durability • Westinghouse Draft Gear users have a special bonus. Housing uniformity makes possible conversion of the Mark 50 and Mark R-500 to Mark H-60 Hydraulic-Friction Draft Gears. This doubles capacity. Cost is nominal. Over a quarter of a million Mark 50 and Mark R-500 gears now in service with this option!

Buy draft gears with the housing that makes the difference —Buy Cardwell Westinghouse!

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INTERNATIONAL DIVISION SAME ADDRESS

CANADIAN CARDWELL COMPANY LTD., LACHINE 620, QUEBEC

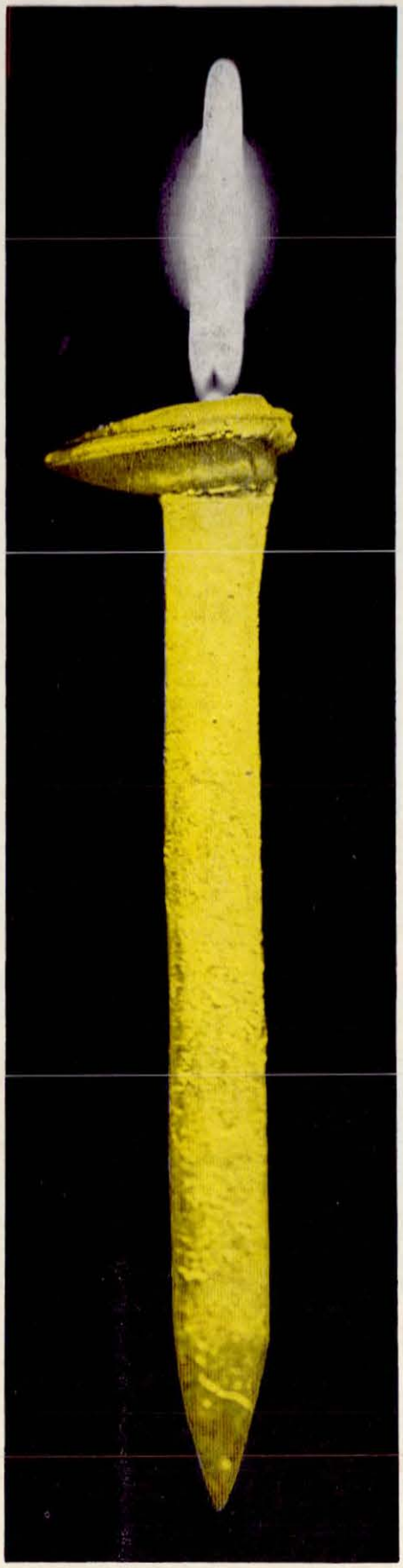
MEMBER RPI

Birthday of one nation, indivisible.

The distance from Berwick, Pennsylvania, to the Great Salt Lake was a "far piece" on May 10, 1869. Yet what happened there was of great significance to the small Pennsylvania hamlet.

The scene was a "Hell on Wheels" town at Promontory, Utah; stores, saloons, dance halls and gaily decorated cars. Ladies and gents milled in a sea of mud while the 21st Military Band played on and on. There were a hundred nameless men from many nations there, but they were all Americans that day in May. There were the graders, the tracklayers, the men who manned the Murphy wagons and six-hitch mule teams, the whackers who had freighted in supplies to keep construction moving. Irish Tarriers from Union Pacific and Central Pacific's (now Southern Pacific) Crocker Coolies—they were all there to see the last golden spike tapped home.

The Pacific railroad, the dream of Asa Whitney, Theodore Judah, Central Pacific's "Four Associates"—Stanford, Crocker, Hopkins and Huntington—Union Pacific's Dix and Durant, and President Lincoln, was a reality. It took six years and 1800 miles of bridges, tunnels and snowsheds. Of fighting Indians, grasshoppers, landslides and buffalo which thundered through



them periodically like armies of tanks. It took a feat of supply unprecedented in history — engines dismantled and shipped piece by piece, iron rail around the Horn, wooden ties where there were no woods. And when the silver sledge fell for the last time, East and West were finally spiked together into one indivisible nation.

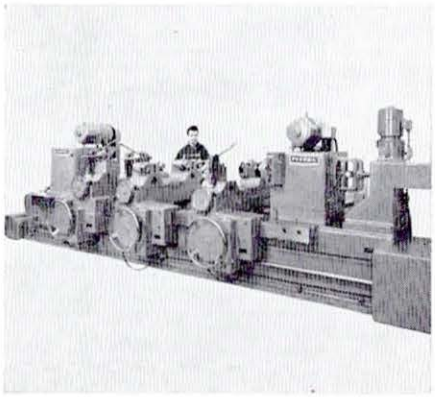
Perhaps the citizens of Berwick even played a part in this grand effort—for Berwick was a railroad "parts" town as far back as 1840. In fact, Berwick built the first all-steel railroad car. Since then, Berwick has supplied the nation's railroad's with hundreds of thousands of cars and materiel—helped to build the world's fastest and most economical transportation system into what it is today. But that system and Berwick's growth would not have been possible without the Pacific railroads' transcontinental feat. Congratulations Union Pacific. Congratulations Southern Pacific!

BERWICK FORGE
& FABRICATING CORP.

Box 188, Berwick, Pa. 18603 • 80 E. Jackson Blvd., Chicago, Ill. 60604

Circle 50 on coupon page 109

NEW PRODUCTS REPORT



Axle lathe (RA-1)

A modified dual-end drive axle lathe with three carriages is designed to recondition locomotive axles. The third (center) carriage is equipped with front and rear indexable tool blocks and, on the front block, burnishing rolls for suspension bearing areas. The new lathe turns wheelseats, gear seats and the body between the wheels. With outer carriages fitted with cutting tools and burnishing rolls, the machine may also be used for freight-car axles. *Farrel Co.*

Tank car coating (RA-2)

A tank car coated with T-500, after completing a 6½-year in-service test, is said to have been in such good condition that it did not require repainting although it carried a 25% ferric chloride solution which quickly destroys ordinary paints. T-500, according to the manufacturer, has long-term gloss retention; rust resistance; color retention in a wide range of colors; and potential savings ranging to $10 per car per year. *Dexter Corp.*

Universal primer (RA-3)

Endcor 550, a yellow alkyd-modified inhibitive primer, can be used with vinyl, alkyd, chlorinated rubber and polyamide-cured epoxy systems. It is applied by brush, rolier, conventional or airless spray and, over old paint, "serves as an excellent tie-coat." On properly prepared metallic substrates, it inhibits corrosion and prevents creeping under-film corrosion. Coverage per coat is 250-300 sq ft (2-3 dry mils film thickness). *Dearborn Chemical.*

Hopper car lining (RA-4)

Scotchkote No. K-3402, a two-part, non-toxic coating system for hopper cars and other applications where resistance to abrasion is imperative, utilizes a polyurethane resin primer base and, with automatic metering and dispensing spray equipment, applies up to 40 mils thick in one coat. It can be used on surfaces in contact with grains, sugar, malt and other dry foods, and resists most chemicals. It can be cleaned with hot water or steam without harm to coating. *3M Co.*

TV camera (RA-5)

A new solid-state 800 line resolution closed-circuit television camera has automatic light compensation, electronic focus regulation and is housed in an aluminum chassis. Horizontal resolution in excess of 800 lines at light levels as low as 10 foot candles can be provided. Only 1 foot candle of incident light is required to provide a visible picture with 700 lines of horizontal resolution. Weight of the unit is 10 pounds. *Motorola Communications & Electronics Inc.*

NEW LITERATURE

NAILABLE STEEL FLOORING. The National Steel Transportation Products Division has issued a four-page, illustrated brochure describing the advantages of nailable steel flooring: furnishing shippers with cars in Class A condition for all kinds of lading; cars can be kept rolling because there is no downtime for floor maintenance and repair; moving more freight with fewer cars. (NL-1)

VEGETATION CONTROL. A new Chapman Chemical Co. bulletin features a "Herbicide Selector Chart" to simplify the choice of herbicide for any type of vegetation control problem. (NL-2)

MOBILE DOCKBOARD. This new Kelley Co. six-page brochure describes the mobile Kelley Rail Ramp for fast, safe loading and unloading of railroad cars. The brochure includes specifications for both 110- and 12-volt models and indicates size of ramp needed for use on centerlines from 8½ ft. to 11 ft. (NL-3)

STRAPPING MACHINES. A. J. Gerrard & Co. is offering a new brochure which covers power equipment to be used with five different types of strapping materials. (NL-4)

LIGHTWEIGHT TRAILERS. Dorsey Trailers has made available a 4-page color brochure describing its line of Golden Series 209 models of high-cube, lightweight trailers. Engineering modifications in the trailers, some of which are shown in the brochure, substantially increase the ruggedness and durability of the line, without increasing the weight. (NL-5)

RAILWAY AGE
THE TRANSPORTATION WEEKLY

30 Church Street, N.Y., N.Y. 10007 READERS' SERVICE (Att. J. Lindstrom)

PLEASE SEND ADDITIONAL INFORMATION ABOUT PRODUCTS IN ADVERTISEMENTS NUMBERED: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109

PLEASE SEND INFORMATION ABOUT PRODUCTS AND LITERATURE DESCRIBED ON PAGE 109 MARKED: RA-1 RA-2 RA-3 RA-4 RA-5 NL-1 NL-2 NL-3 NL-4 NL-5

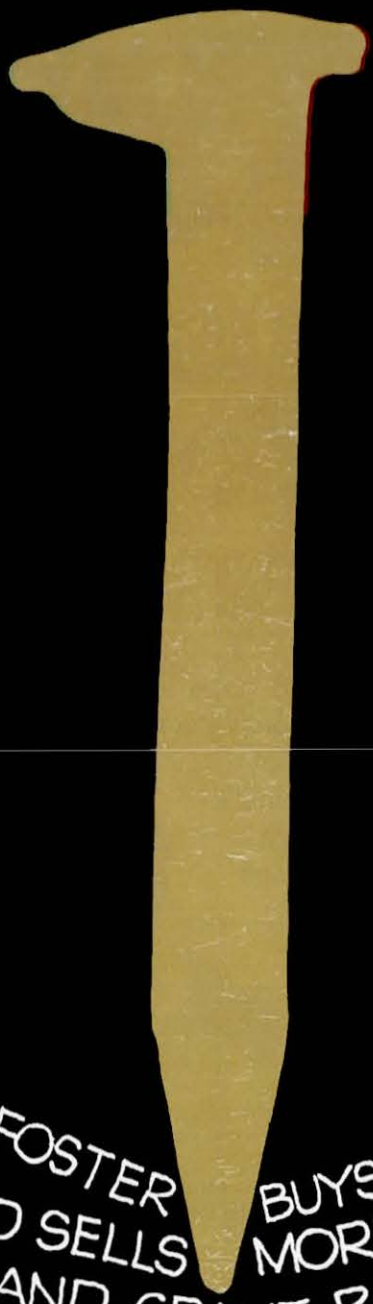
NAME ..... **TITLE** .....

ADDRESS .....

COMPANY .....

CITY ..... **STATE** ..... **ZIP** .....

• **Inquiries can be processed only if title and company are shown.** 5/10/69



FOSTER BUYS
AND SELLS MORE TEE
AND CRANE RAIL
AND ACCESSORIES
THAN ANY OTHER COMPANY
IN THE WORLD TODAY,
AND WE HAVE THE
INDUSTRY'S MOST
EXPERIENCED
DISMANTLING TECHNICANS.
ASK US TO BID ON YOUR
NEXT RAIL TAKE-UP.

FOSTER

LOCAL SERVICE NATIONWIDE/L.B. Foster Co., Pittsburgh, Pa.

Dial 614-488-1151 for rush delivery of Traction Motors and Generators

Those new looking motors and generators awaiting your phone calls at National Electric Coil are veterans of many months of service. Shipped to us under National's popular unit-exchange plan, they've been cleaned, dismantled, rebuilt and rigidly tested—proved ready to take over as your other equipment demands replacement.

Here's One of the Pluses that Contribute to National Dependability in Generators.

After field coils and bars have been assembled on the pole pieces, they are vacuum-pressure impregnated with an epoxy resin. Then, after installation in the frame, the entire field structure is dipped in silicone varnish, making it better able to resist vibration and moisture penetration.

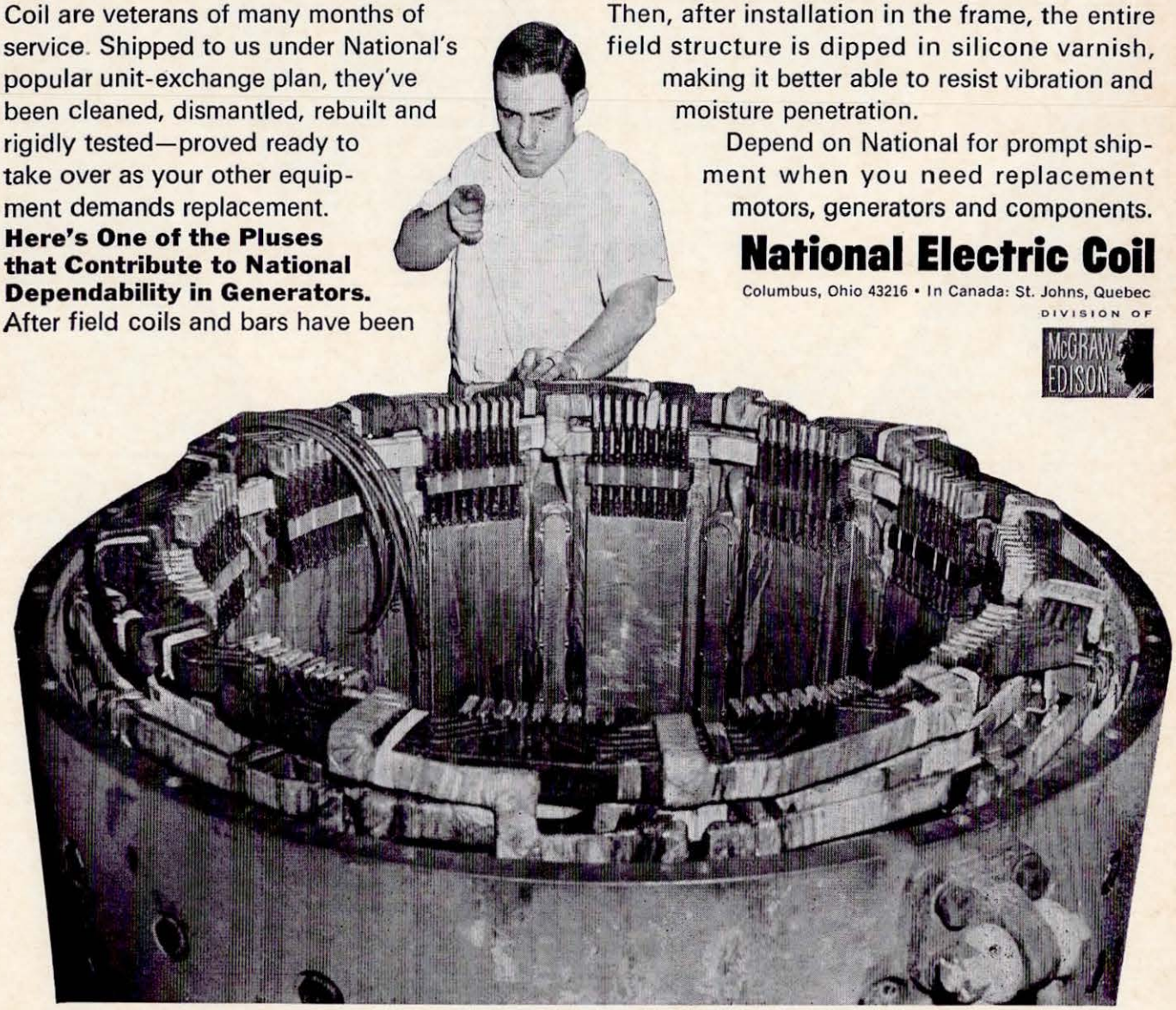
Depend on National for prompt shipment when you need replacement motors, generators and components.

National Electric Coil

Columbus, Ohio 43216 • In Canada: St. Johns, Quebec

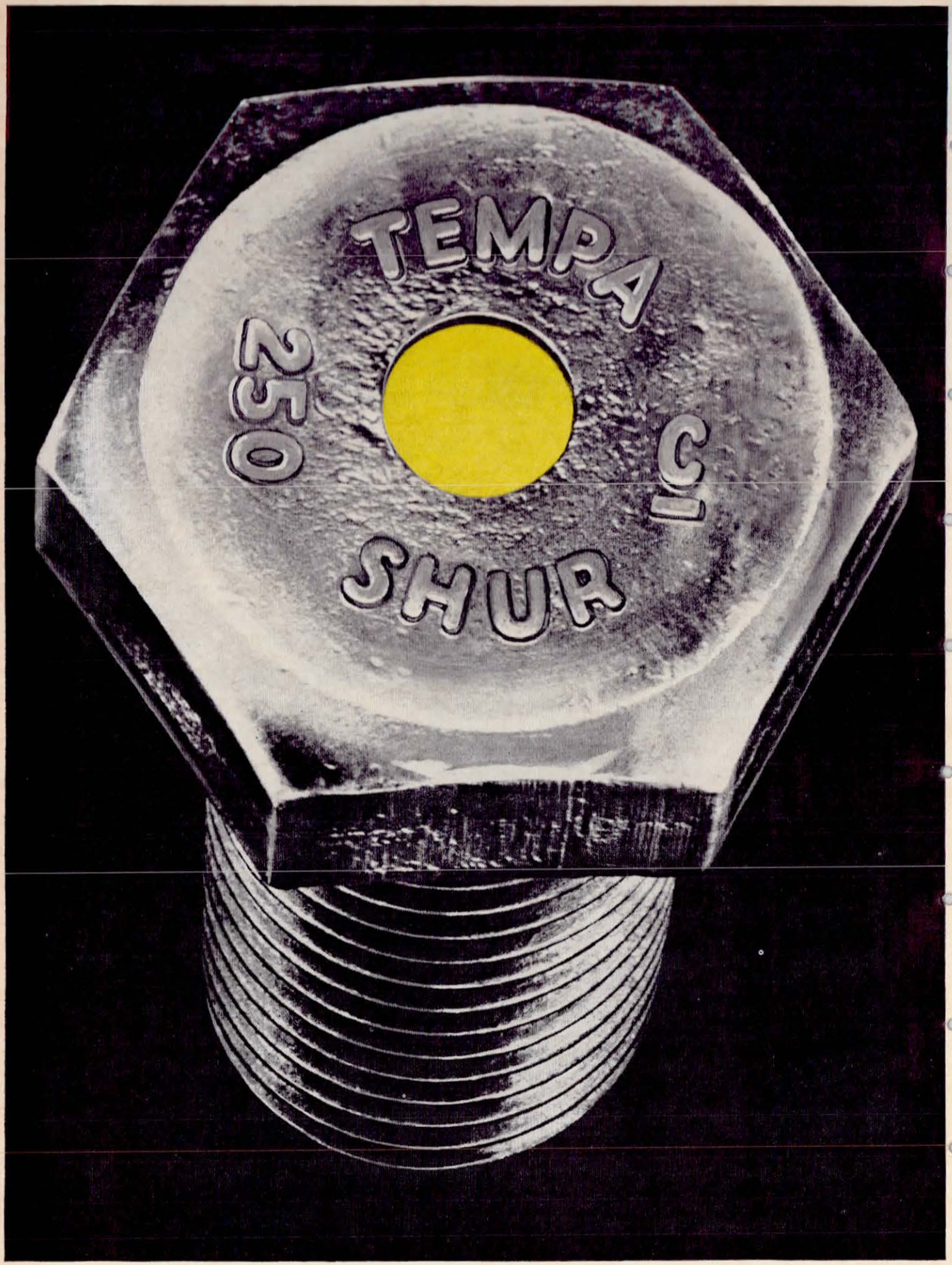
DIVISION OF

McGRAW EDISON



Tying rubber snubbers between coil connectors prior to dipping the entire field structure.

Circle 60 on coupon page 109

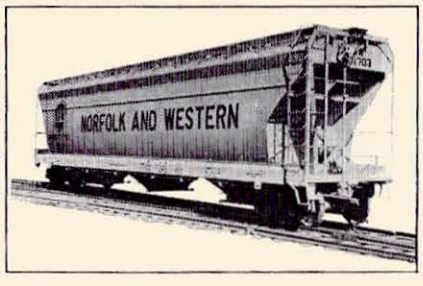

TEMPA
250
C
SHUR

New SPS Tempa-Shur™ Screw helps you spot a hotbox even after it's cooled off.

Replace a standard bearing screw with an SPS TEMPA-SHUR Screw. The bright, fluorescent yellow pellet disappears when the screw temperature hits 250°F. What's more, you'll know you had a hot bearing minutes . . . hours . . . even days later. And, you won't be "shopping" the wrong car.

The TEMPA-SHUR Screw is the first truly practical supplement to electronic hotbox detectors. While most electronic detectors warn that a journal box is overheating, the telltale missing dot of a TEMPA-SHUR Screw will tell you exactly which one is causing trouble.

TEMPA-SHUR Screws give off no smoke, no stink, no false alarms that run up maintenance time and costs. They give you fast, safe, positive GO, NO-GO indication of troublesome bearings even after they've cooled off. That's one reason they're now in use. Another reason: TEMPA-SHUR Screws make an ideal primary detection system. And our tests show them to be as tough as any standard bearing screw.



Write today for complete test results and specifications on the new SPS TEMPA-SHUR Screw — the one with the yellow dot. Standard Pressed Steel, Industrial Fastener Division, 17800 Northland Park Court, Southfield, Michigan 48075. (313) 444-4960.

™Trademark Standard Pressed Steel Co.

SPS

Industrial Fastener Division Standard Pressed Steel Co.

Circle 53 on coupon page 109

(Continued from page 106)

staff assistant to president, succeeding **W. W. Rogers,** resigned.

John E. Shannon, district manager of sales, Duluth, Minn., retired recently after more than 40 years of service.

Raymond H. Kocher, manager of the mail, baggage and express department, retired recently after 42 years of service.

NORFOLK & WESTERN.—John T. Hiner, engineer maintenance of way, Roanoke, promoted to assistant chief engineer—maintenance.

Thomas B. Mason will join the N&W law department July 1 as general attorney. Mr. Mason, United States Attorney for the Western District of Virginia, has submitted his resignation to President Nixon, asking that it be effective June 13.

J. D. Snearline, sales manager, Fort Wayne, Ind., retired April 1, after almost 49 years of service with the N&W.

PENN CENTRAL.—Howard C. Kohout, vice president and general manager, Western Region, Chicago, appointed vice president—passenger service, Philadelphia. **Kenneth E. Smith,** assistant general manager, Southern Region, Indianapolis, succeeds Mr. Kohout.

Charles R. Drake, Pacific coast freight sales manager, San Francisco, appointed assistant vice president—freight sales, staff, New York, succeeding **Roger G. Meldahl,** named assistant vice president, freight sales, New York. **Philip A. Butler,** assistant sales manager, Pacific Coast area, succeeds Mr. Drake.

J. Stewart Warden
Reading

Ralph F. Nogg
REA

Edwin G. Ross
REA

B. J. Carlin
Santa Fe

C. Robert Burr, director—traffic services, named assistant vice president—traffic administration, Philadelphia, succeeding **C. G. Magruder,** retired (RA, March 17/24, p. 49).

Robert F. Lawson, general manager, New York Region, appointed general manager, Eastern Region, Philadelphia, succeeding **John M. McGuigan,** named general manager, New Haven Region.

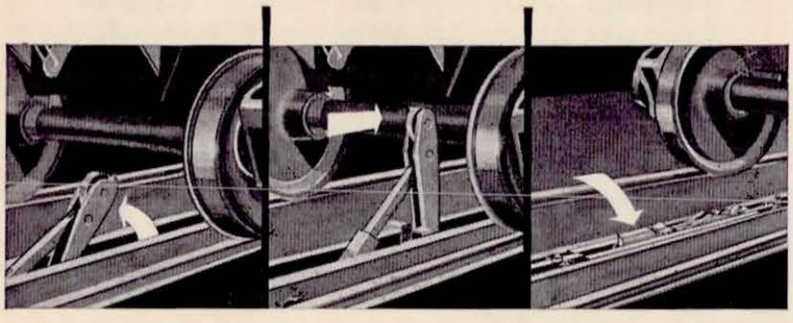
Edward P. Frasher, general superintendent—transportation, Northern Region, Detroit, succeeds Mr. Lawson as general manager, New York Region.

PC appointments at New Haven, Conn., not previously reported in RA: **K. T. Kelly,** superintendent passenger transportation; **J. P. Radigan,** regional supervisor, passenger car utilization; **J. L. Stanek,** superintendent freight transportation; **D. C. Molen,** regional supervisor freight train operation; **John Shoemaker,** regional supervisor passenger train operation; **E. F. Tobin, Jr.,** administrative assistant; **A. J. Powers,** regional supervisor operating rules; **R. D. Walker,** superintendent stations; **G. T. Devlin,** manager damage prevention; **S. E. Cavalieri,** regional safety supervisor; **J. DiNello,** regional supervisor automotive equipment; **R. B. Dugan,** regional supervisor car utilization; **C. H. Davis,** regional industrial engineer; **J. C. Brumleve,** regional supervisor data control; and **T. K. Brown,** executive assistant.

C. E. Ragland is now assistant vice president—freight sales, PC, Boston, Mass. Mr. Ragland was formerly vice president—freight traffic of the New Haven.

(Continued on page 119)

Pops Up Moves Cars Lays Low



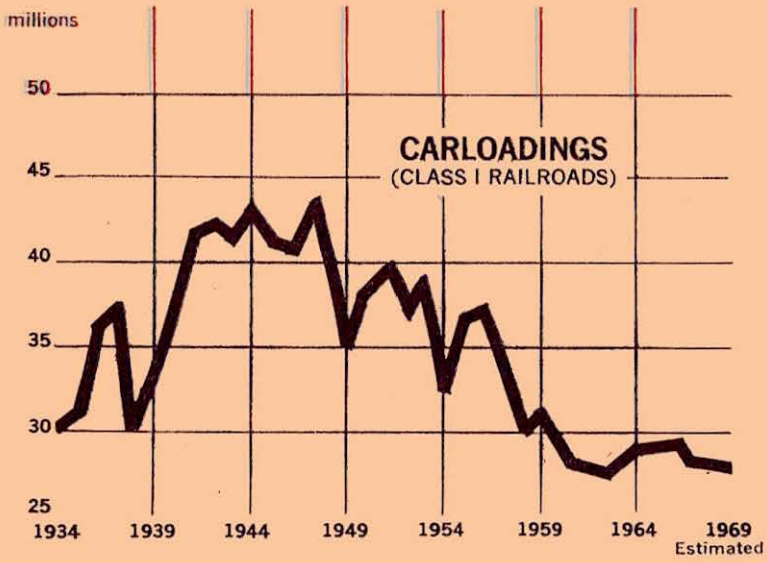
Your Whiting ROBOT System gives you remote control of rail car progression from a central console. You get automatic cycling and automatic car indexing through wheel counting. ROBOT arm can contact axle, side frame or coupler—exert 5,000 to 70,000 lb. pull. You enjoy new efficiency, safety and economy in any repair or service operation. Write for new Bulletin GT-104, *Whiting Car Progression Systems.*

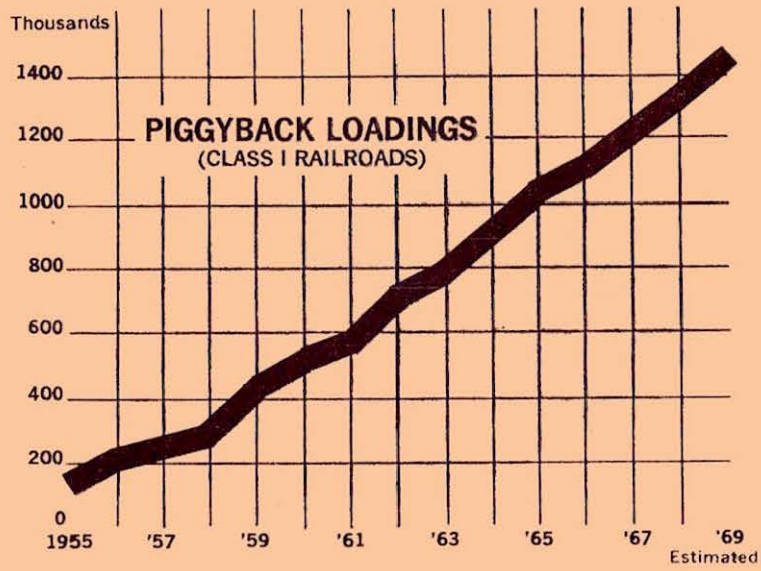
WHITING CORPORATION
HARVEY, ILLINOIS 60426 U.S.A.
Circle 57 on coupon page 109

LOWEST COST
per hole punched

PUNCHES and DIES
cost less . . .
. . . last longer
Send for Catalog No. 118

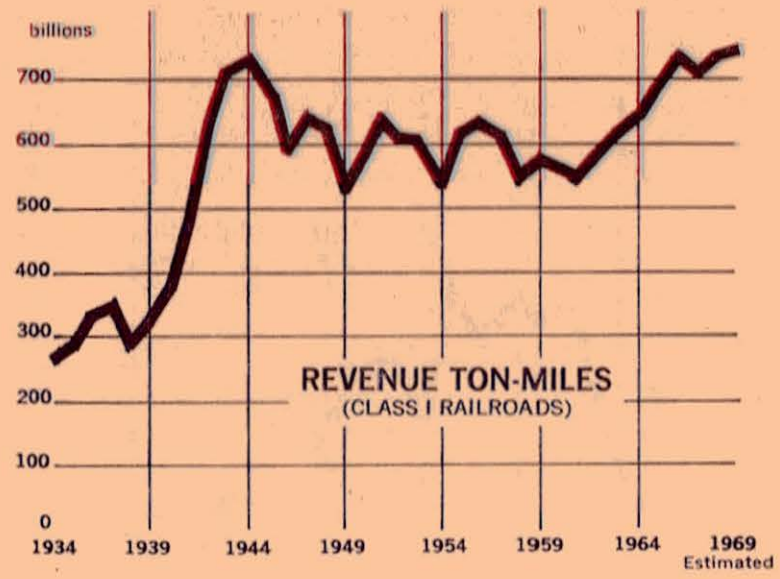
THE CLEVELAND STEEL TOOL CO.
474 E. 105th ST.
CLEVELAND, OHIO 44108
PHONE: 216-681-7400





Current Statistics

Net income, Class I roads	
Twelve months, 1968	$693,000,000
Twelve months, 1967	$551,000,000
New freight cars on order	
April 1, 1969	34,068
April 1, 1968	22,605
New freight cars delivered	
3 mos., 1969	14,999
3 mos., 1968	16,183
Serviceable cars	
March 1, 1969	1,378,477
March 1, 1968	1,400,628


billions
700
600
500
400
300
200
100
0
REVENUE TON-MILES
(CLASS I RAILROADS)
1934
1939
1944
1949
1954
1959
1964
1969
Estimated

billions of dollars
10
8
6
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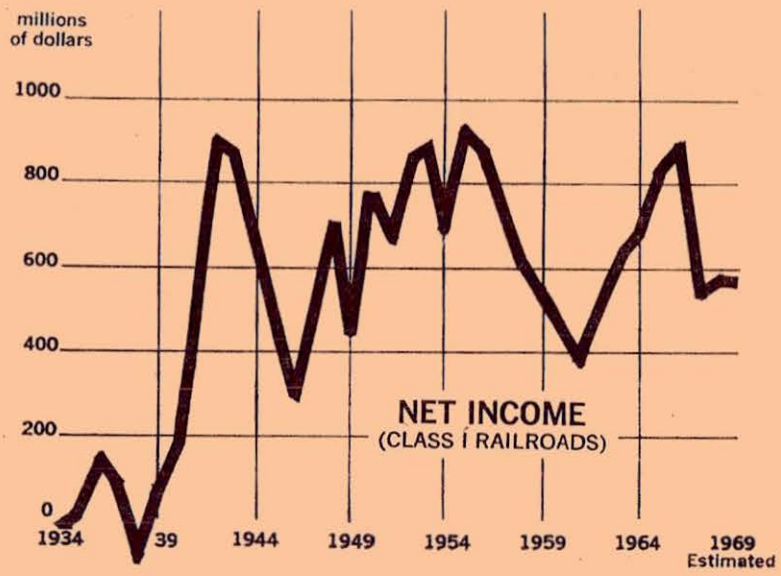
0
OPERATING REVENUES
(CLASS I RAILROADS)
1934
1939
1944
1949
1954
1959
1964
1969
Estimated


millions
of dollars
1000
800
600
400
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0
NET INCOME
(CLASS I RAILROADS)
1934
39
1944
1949
1954
1959
1964
1969
Estimated

MARKET OUTLOOK

CARLOADINGS

Loadings of revenue freight in the week ended May 3 were not available when this issue of Railway Age went to press.

REVENUE FREIGHT CARLOADINGS

Commodity	Apr. 26 week	Preceding week	Per cent change
Grain	20,269	18,980	+ 6.8
Farm products	14,359	14,247	+ 0.8
Metallic ores	35,370	28,348	+24.8
Coal	110,788	106,260	+ 4.3
Crushed stone, gravel & sand	33,629	32,524	+ 3.4
Nonmetallic minerals	10,813	9,794	+10.4
Grain mill products	19,754	19,909	— 0.8
Food & kindred products	24,227	23,713	+ 2.2
Primary forest products	25,462	22,738	+12.0
Lumber & wood products (except furniture)	16,384	15,602	+ 5.0
Pulp, paper & allied products	25,151	24,786	+ 1.5
Chemicals & allied products	34,892	36,362	— 4.0
Petroleum products	10,883	11,423	— 4.7
Stone, clay & glass products	23,464	21,861	+ 7.3
Coke	7,977	8,417	— 5.2
Metals & products	31,291	30,614	+ 2.2
Motor vehicles & equipment	24,246	23,899	+ 1.5
Waste & scrap materials	15,257	15,071	+ 1.2
Forwarder & shipper assn. traffic	7,038	6,727	+ 4.6
All other carloads	75,849	72,913	+ 4 0
LCL traffic	2,083	1,985	+ 4.9
Total cars loaded	569,186	546,173	+ 4.2

CUMULATIVE TOTAL, 17 WEEKS	1969	1968	1967
	8,793,604	8,847,339	8,989,869

IN CANADA

CUMULATIVE	Revenue Cars Loaded	Total Cars Rec'd from Connections
April 14, 1969	1,026,294	367,405
April 14, 1968	994,524	356,643

FREIGHT-TRAIN CARS

● *Grand Trunk Western.*—Ordered 50 86-ft auto-parts box cars from Greenville Steel Car, at a cost of $1.5 million. Delivery is scheduled for September.

● *Trailer Train.*—Ordered 569 cars as follows: from ACF, 70 89 ft, 4-in standard-level cars; from Bethlehem Steel, 163 89-ft, 4-in. standard-level cars; and from Pullman-Standard, 155 all-purpose cars and 118 low-level cars (both lots consisting of 89-ft, 4-in. cars), and 63 60-ft flat cars. Trailer Train has purchased 2,379 new cars since Jan. 1. As of April 30, TTX had 50,931 cars in service or on order.

● *March bad order ratio 0.1% below 1968.*—Class I roads on March 1 owned 1,454,787 freight cars, 23,647 fewer than on March 1, 1968, according to AAR report summarized below. Bad order ratio was 0.1% lower than last year.

	March 1, 1969	March 1, 1968	Change
Car ownership	1,454,787	1,478,434	—23,647
Waiting repair	76,310	77,806	— 1,496
Repair ratio	5.2%	5.3%	— 0.1%

CAR OWNERSHIP

● *Serviceable cars.*—Revenue freight cars in serviceable condition owned by Class I railroads on March 1 totaled 1,378,477, compared with 1,400,628 on March 1, 1968, according to most recent AAR Car Service Division report. Estimated total ownership of all railroad- and privately-owned freight cars on March 1 (see table below), was 1,794,677 (average capacity: 64.54 tons), compared with 1,816,418 (average capacity: 63.18 tons), on March 1, 1968.

ESTIMATED OWNERSHIP—ALL REVENUE FREIGHT CARS

(March 1, 1969 vs March 1, 1968)

		Box	Covered Hopper	Gondola	Hopper	Flat	Refrig.	All Others	Total
Class I	1969	550,014	122,589	198,120	406,111	69,207	52,757	55,989	1,454,787
	1968	564,849	120,107	198,993	417,414	67,580	51,560	57,931	1,478,434
RRO&C Refrig.*	1969	0	0	0	0	0	46,320	0	46,320
	1968	0	0	0	0	0	50,763	0	50,763
Private	1969	1,109	30,205	2,055	2,155	43,599	16,105	174,256	269,484
	1968	1,469	28,100	292	2,828	40,936	14,901	172,129	260,655
Class II & S&T†	1969	8,048	715	4,697	7,862	580	1,018	1,166	24,086
	1968	9,298	893	5,277	8,668	649	687	1,094	26,566
GRAND TOTAL	1969	559,171	153,509	204,872	416,128	113,386	116,200	231,411	1,794,677
	1968	575,616	149,100	204,562	428,910	109,165	117,911	231,154	1,816,418

*Railroad owned and controlled refrigerator car lines.
† Class II railroads and switching and terminal companies.

NEW FACILITIES

● *Cleveland Transit System.*—Will buy a $25,000 International Harvester Hy-Rail truck, capable of running on both rail and road, for inspecting power lines.

YOU OUGHT TO KNOW

"We've turned the corner," says Saunders

Penn Central had serious operating problems during the start-up phase of merger, concedes Chairman Stuart T. Saunders—but, he told the Hartford, Conn., Chamber of Commerce, "I am sure that the worst is behind us. We very definitely have turned the corner and are steadily restoring the quality of our service." Evidence of this, said Saunders, has come in the form of "letters and telephone calls received in the past six weeks from shippers commenting on a marked improvement." One of the thorniest problems—the incompatibility of computer systems—is being resolved and "we expect to have the combined network in full operation by July 1," he said.

Chicago to give senior citizens reduced fare

The Chicago Transportation Board has approved a special reduced fare for senior citizens. The fare, which will be identical to student rates, will be applicable Monday through Saturday from 9 a.m. to 3 p.m. and on Sundays and certain holidays from 7 a.m. to midnight. To qualify for the reduced fare, senior citizens 65 years and older must show a Medicare card or a special CTA identification card when paying fares.

Milestone for CZ roads and their advertising

The "California Zephyr" advertising campaign—believed to be the longest ever conducted on behalf of a passenger train—has now entered its 21st year. And it's moving right ahead, despite continuing declines in long-distance train travel. Burlington, Rio Grande and Western Pacific began the campaign early in 1949, shortly before the train made its maiden trip.

Ted O'Meara bows out after 47 years

One of the industry's best-known practitioners of the art of public relations—Ted O'Meara of the Chesapeake & Ohio/Baltimore & Ohio—has retired after 47 years of railroad service. Under O'Meara's editorship (1943-1958), C&O's magazine "Tracks" won international recognition. Its articles were reprinted in Reader's Digest, Coronet, Railway Age, Trains and many daily papers. O'Meara left the magazine to take on broad-ranging public relations assignments. Most recently he was public relations manager for C&O/B&Os' Southern Region at Richmond, Va.

Accidents rise, casualties drop, in February 1969

There were 706 train accidents in February 1969, compared with 691 in February 1968, the Federal Railroad Administration reports. However, the number of casualties was down—167 fatalities, compared with 219 in February 1968; and 1,946 injuries, compared with 2,035. Also, for the combined first two 1969 months, train accidents were down to 1,462 from 1,474 in the like 1968 period. Reported separately are 115 grade crossing deaths in February, compared with 149 in February 1968. For the first two months the figures are 266 grade crossing fatalities, compared with 284 (1968).

Penn Central coal facility linked by steel belts

Penn Central's new $1.5-million coal-handling facility in Ashtabula, Ohio, boasts a 1,012-ft.-long conveyor that actually spans the Ashtabula River. The conveyor is equipped with 2,035 feet of B.F. Goodrich conveyor belt, internally reinforced with steel cables, that travels at a speed of 900 feet per minute and hauls 3,000 tons of coal per hour at peak efficiency. After carrying the coal from the east bank, where the train and car positioner and rotary car dumper is located, the coal is transferred to another conveyor, 2,629 feet long, on the west side via a specially constructed bridge, where it is discharged either for outdoor storage or along 417-foot long conveyors to silos. A final dock conveyor, 904 feet long, moves the coal onto ships at a rate of 8,000 tons per hour.

(Continued from page 114)

Joseph L. Doyle is assistant general attorney, Detroit.

W. P. Eckfeldt, freight sales manager, Philadelphia, appointed assistant vice president–freight sales there, succeeding **G. A. Shaffer. C. B. Alban** is assistant director–passenger service.

M. G. Collins appointed director–concessions, and **J. J. Flood,** director–leased property administration, New York.

READING.—J. Stewart Warden, manager passenger services, Philadelphia, appointed director of passenger services. **H. James Palmer,** supervisor passenger sales and service, named manager, contract passenger services.

Joseph M. O'Malley named to the legal staff, Law Department, Philadelphia. Mr. O'Malley had been a special agent for the Federal Bureau of Investigation.

REA EXPRESS.—Ralph F. Nogg elected executive vice president and **Edwin G. Ross,** elected vice president of finance and administration, New York. Mr. Nogg was trustee and chief executive officer, Yale Transportation Corp., New York. Mr. Ross was corporate chief financial officer, Vornado, Ind.

Three executives from the management consulting department of Peat, Marwick, Mitchell & Co., Newark, N.J., have joined REA. **Patrick F. Dowling, Jr.,** named controller; **Bernard J. Ryan,** treasurer, and **David P. Wachsman,** director of management information services.

ST. LOUIS SOUTHWESTERN.—John F. Russell, general agent, Cleveland, Ohio, retired April 30, after more than 45 years of service.

SANTA FE.—Has established an international sales department. **B. J. Carlin** appointed manager-international sales, Chicago. Named district managers-international sales are **E. M. Leonard,** Chicago; **H. J. DeSoiza,** New York; **G. K. McLaon,** Houston; **S. A. Brigham, Jr.,** San Francisco; **A. B. Gibson,** Los Angeles. **T. W. Peterson** and **R. A. Morton** appointed representatives-international sales, San Francisco; **H. L. Williams** and **R. J. McDill** named to that position at Los Angeles and Long Beach, Calif., respectively.

SOUTHERN.—Samuel R. Goodman, assistant vice president, promoted to senior assistant vice president–marketing, remaining at Washington, D.C.

Regional materials managers appointed: **Claude Smith,** Knoxville, Tenn.; **J. Travis Kimbrough,** Atlanta, Ga.; **Walter U. Palmer,** Birmingham, Ala.; **Lester H. Finotti,** Spartanburg, S.C.; **Walter W. Folger,** Chattanooga, Tenn.; **G. Drewey Wesson,** Columbia, S.C.; and **Grady H. Corbin,** Charlotte, N.C.

Assistant material handling managers named: **Robert L. Dickinson,** Knoxville; **James O. Mangum,** Atanta; **George J. Loflin,** Chattanooga; **Allen T. Head, Sr.,** Sevier Yard, Tenn.; **Miller L. Heath, Jr.,** Inman Yard, Ga.; **Jack N. Gregory,** Spartanburg; **Charles L. Bonasera,** Charlotte; and **B. Earl Roberts,** Birmingham.

Theodore H. Field appointed manager regional centers–purchasing, and **Robert G. Woodall,** assistant manager regional centers–purchasing, Washington, D.C.

Position abolished: General storekeeper and traveling storekeeper, Washington; division storekeepers at Knoxville, Atlanta, Birmingham, Spartanburg, Chattanooga, Columbia and Charlotte; assistant division storekeepers at Knoxville, Atlanta and Chattanooga; storekeepers at Inman and Sevier Yards; and general foremen at Birmingham and Chattanooga.

Calvin Carlo Dover appointed assistant buyer, Charlotte.

SOUTHERN FREIGHT ASSOCIATION.—J. W. Cleveland, member, Standing Rate Committee, Atlanta, Ga., elected chairman, Standing Rate Committee, succeeding **J. H. McMahan,** who retired April 1, after nearly 49 years of service.

OBITUARY

Andrew P. Hedin, 64, retired assistant general freight agent, **Milwaukee,** died April 14 in St. Ann's Hospital, Chicago.

Edward G. Mathes, 50, Cleveland general agent, freight sales, **Chicago South Shore & South Bend,** died April 19.

Clarence N. Wesley, 81, retired director and executive vice president, **Standard Railway Equipment Co.** (now **Stanray Corp.**), died April 22 in Illinois Masonic Hospital, Chicago.

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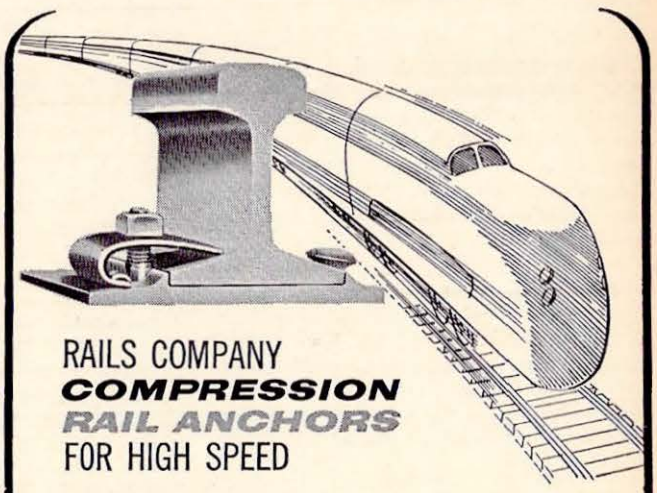

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SUPPLY TRADE

Kenneth R. Germann has joined **L. B. Foster Co.** as rail products specialist, San Francisco district office.

Robert M. Nordin has been named manager—rail products, Chicago district. He was formerly a salesman for Foster.

W. L. Martens, who joined **Timken Bearing Co.** in 1967 as a railroad sales engineer trainee, was appointed sales engineer—Railroad Division, early this year, assigned to the Chicago area office.

Due to a printer's error in RA, April 28, p. 64, the photographs of **Richard W. Gear,** Eastern sales manager, **Magnus Metal Corp.,** New York, and **C. F. Hammond, III,** manager—railroad and marine sales, **Great Dane Trailers, Inc.,** Savannah, Ga., were transposed. The correctly identified photographs are published above.

Milton Ginsburg, assistant to the president, **Gindy Manufacturing Co.,** Downingtown, Pa., has been appointed president. **Melvin I. Kolker** has been named vice president, new trailer sales; **Jerome Rensel,** vice president, used trailer sales; and **Anthony M. Cerra,** vice president operations.

Robert G. Jurs, assistant manager, transportation industry, **Kaiser Aluminum & Chemical Sales, Inc.,** has been named industry sales manager, transportation markets, to succeed **M. C. Crockett,** named to the new position of manager, marketing programs and development, aluminum division.

Peter Sclafani has been named president of **Intermodel Contrailers, Inc.,** wholly owned subsidiary company of **Allied Products Corp.,** Chicago. This subsidiary, as part of Allied's Transportation Group, will lease and sell trailers, containers and other related equipment, and specialize in consulting and engineering services. Much of the equipment will be manufactured by other companies in the Transportation Group. Mr. Sclafani has been president of Waterfront Transfer Corp., Hoboken, N.J.

R. Gordon Thorpe has been appointed director of railroad sales, **Strick Corp.,** Fairless Hills, Pa. Mr. Thorpe was formerly sales manager, Chicago Branch.

Howard Marx, sales manager, North Bergen, N.J., has been apopinted container sales manager.

William C. Sneed has been appointed to a sales position on the staff of the Chicago office, of the **Rails Co.** Mr. Sneed was formerly industrial sales manager, Protane Corp., Cleveland.

Robert H. Seese, president, **Berwind Railway Service Co.,** has been appointed chairman of the board. **Albert M. Hileman,** vice president and general manager, has been named president. **O. Wayne Fulmer,** general manager, Houston Plant, named vice president. **John H. Gery,** assistant general manager, has been named vice president and treasurer.

George Christie has been appointed vice president, **Consolidated Equipment Co.,** Montreal, Que., Canada. **S. Lorne Eason** has been appointed assistant vice president.

Robert L. Smith has been appointed marketing manager, Transportation Control Systems, Commercial Electronics Division of **Sylvania Electric Products, Inc.,** at Bedford, Mass. Mr. Smith is responsible for sales of the company's KarTrak Automatic Car Identification system to the railroad, motor carrier and transit industries.

Eldred H. Natschke has been elected vice president, **Universal Railway Devices,** Chicago. **J. C. Schultz** is a sales representative for **Cardwell Westinghouse Co.** and Universal Railway Devices Co., St. Louis.

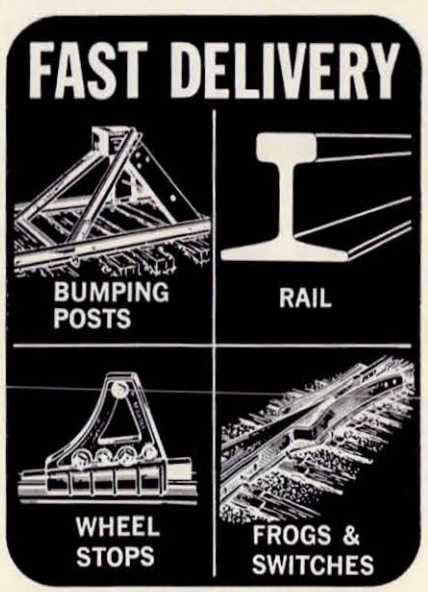
William W. Hausman joined **General Steel Industries,** St. Louis, early this year as manager of market research, a newly created corporate position.

E. Hutchinson has been appointed district manager, **Edgewater Corp.,** and its subsidiaries **Latrobe Forge & Spring, Inc.,** and **Janney Cylinder Co.** He will be responsible for sales of both railroad and industrial products.

Ronsco Supply Co., Ltd., has been formed with headquarters at 1440 St. Catherine Street, Montreal, Que., Can., to supply specialty components to the transportation industry. **Ronald S. Wilson** and **Ronald W. Maddocks** are the two principal Ronsco officers. Mr. Maddocks was formerly vice president, railway division, **IEC-Holden, Ltd.** Mr. Wilson was general sales manager, railway equipment products, **Hawker-Siddeley Canada, Ltd.,** and is the 1968-69 president, **Canadian Transportation Research Forum.** The company will represent Youngstown Steel Door Co., Brenco, Inc., Sloan slack adjusters and Ex-Cello railway pins and bushings.

Thomas W. Chisholm has been appointed manager, automotive and transportation marketing for **Owens-Corning Fiberglas Corp.**

Roger G. Kimber has been appointed a sales representative of **Scullin Steel Co.,** St. Louis.



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VIEWPOINT

Just what is a railroad, anyway?

One hundred years after the driving of the Golden Spike, you would think that we could at the very least agree upon what a railroad *is*. We can't. And our failure to do so lies at the very root of "the railroad problem."

Is a railroad just like any other business, responsible only to the pocketbooks of its stockholders? Some railroad men profess to believe this. If they act on this belief, they're doomed—at least as railroaders. Any railroader who believes that selling railroad service is like selling toothpaste is likely to find himself in the toothpaste business. What distinguishes a railroad from Procter & Gamble is its uniqueness—its essentiality—its ability to do something that no other enterprise yet devised by man can do. If Procter & Gamble decides to go out of business, why not? Other companies can supply the same product. But if present management can't run railroads, at a profit to stockholders, then government is going to run them—at a loss to the taxpayers.

Is a railroad, then, a public utility, to be operated with only this or that segment of the public in mind? That's the way railroads in most of the world are run—as tools of, not participants in, the national economy. What this produces is all too well known to transportation economists in such countries as France, England, Japan: losses to taxpayers averaging 20 cents on the dollar; and not notably efficient service.

Sensible men reject both of these extremes and take the middle path, for which there is a convenient term: A railroad is a "quasi-public corporation."

But what in the world is a quasi-public corporation?

Far too often, only the second half of the term, "public," seems to be understood. An ICC examiner has suggested, for example, that railroads, in return for the great benefits that are presumed to flow from their quasi-public status, ought to be required to furnish whatever trains the "public" needs, or thinks it needs, at damn-the-loss. That this could lead to nationalization of an industry whose rate of return is steadily less than 3% was not explored in any depth by this public servant.

THE OTHER SIDE OF THE EQUATION

What most people seem to forget is that anything that is quasi-public is, of necessity, also quasi-private. Doesn't it follow that if we are to retain railroads as quasi-public corporations, the other half of the equation—the private investors—must also be considered?

Elsewhere in these pages, our editors describe "The Second Revolution in Transportation." We believe it is coming; we believe railroads must inevitably be an important part of it. The question is whether this revolution is going to be managed by private enterprise—or by men like that ICC examiner.

The obligations of the railroads to the public are spelled out almost daily in the halls of Congress. It's time that the other side of the equation was explored—and Golden Spike Year seems a good time to begin. Later could be too late.

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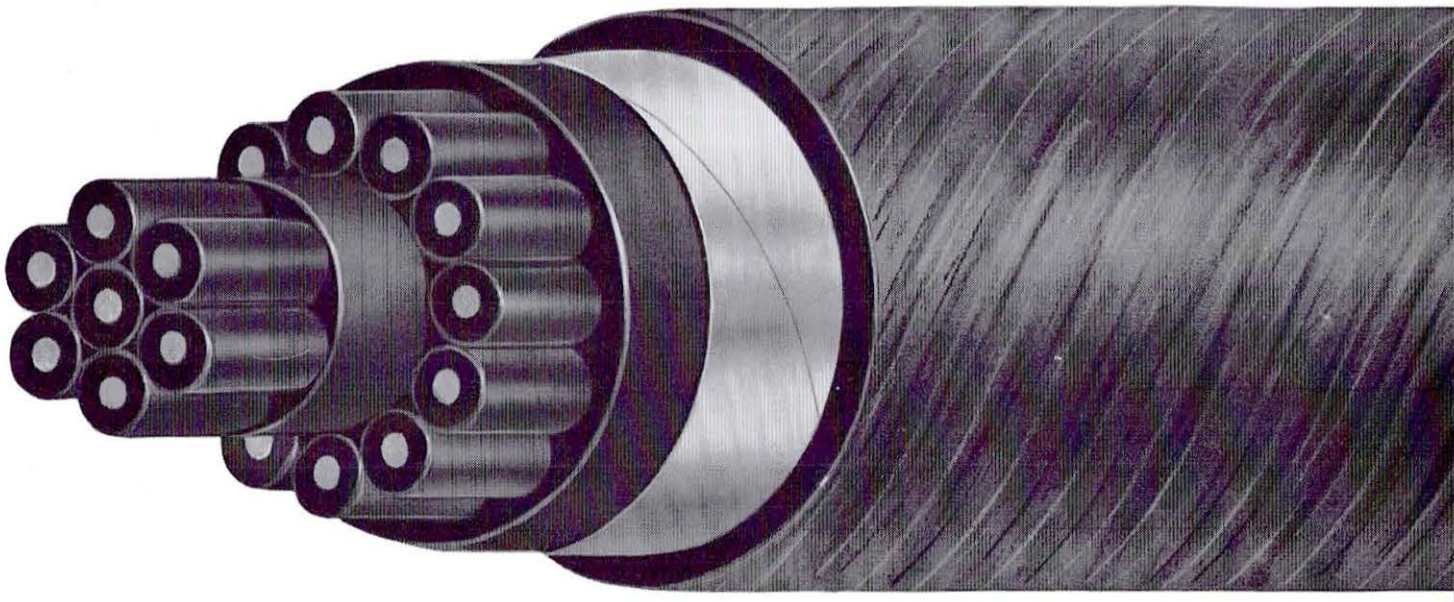

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